

ANNEXURE I

LEVELLISED GENERIC TARIFF FOR VARIOUS RENEWABLE ENERGY TECHNOLOGIES FOR FY 2020-21

1. The levellised generic tariffs for Small Hydro projects, Biomass with Rankine Cycle, Non-fossil fuel-based co-generation, Biomass Gasifier and Biogas based projects, for FY 2020-21 are discussed below.
2. For Solar PV, Floating Solar, Solar Thermal, Wind (onshore and offshore), MSW/RDF, Renewable hybrid energy projects, Renewable energy with storage projects and other emerging renewable energy technologies, the tariff will be project specific. The separate petition is required to be filed for determination of project specific tariff as per Regulation 8 of RE Tariff Regulations.

A. Useful Life

3. The clause (hh) of sub-Regulation (1) of Regulation 2 of the RE Tariff Regulations defines 'useful life' in relation to project, including dedicated evacuation system, from the date of commercial operation (COD) of such project, shall mean the following:

Renewable Energy Projects	Years
Small Hydro	40
Biomass power project with Rankine Cycle technology	25
Non-fossil fuel-based co-generation	25
Biomass Gasifier	25
Biogas	25

B. Control Period

4. Regulation 5 of the RE Tariff Regulations specifies that the Control Period for determination of tariff for renewable energy projects (RE projects) shall be from 01.07.2020 to 31.03.2023. The provision to Regulation 5 specifies that the tariff determined for the RE projects commissioned during the control period, shall remain valid for the tariff period (Useful life of the project). Accordingly, the tariff determined is for the first year of the control period, which shall be applicable for the Projects commissioned during the period from July 1, 2020 till March 31, 2021.

C. Tariff Structure

5. Regulation 9 of the RE Regulations stipulates that the tariff for renewable energy sources shall consist of the following components:
 - a. Return on equity;
 - b. Interest on loan capital;
 - c. Depreciation;
 - d. Interest on working capital; and
 - e. Operation and Maintenance expenses
6. For renewable energy technologies having fuel cost component, like biomass power projects with rankine cycle technology, non-fossil fuel based cogeneration, biomass gasifier based projects and biogas based power project, single part tariff with two components i.e. fixed cost component and fuel cost component, is to be determined.

D. Tariff Design

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

“(1) The generic tariff shall be determined, on levellised basis, considering the year of commissioning of the project, for the tariff period of the project:

Provided that for renewable energy projects having single part tariff with two components, fixed cost component shall be determined on levellised basis considering the year of commissioning of the project while fuel cost component shall be determined on year of operation basis in the Tariff Order to be issued by the Commission.”

E. Levellised Tariff

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

F. Discount Factor

9. Regulations 10 (2) specify methodology to calculate discount factor for the

purpose of levelled tariff computation as under:

“10. Tariff Design

... ..

(2) For the purpose of levelled tariff computation, discount factor equivalent to post-tax weighted average cost of capital shall be considered.”

10. Accordingly, the discount factor considered for this exercise is equal to the post tax weighted average cost of capital on the basis of normative debt: equity ratio (70:30) specified in the Regulations. Considering the normative debt equity ratio and weighted average of the post-tax rates for debt and equity component, the discount factor is calculated.

11. Interest Rate considered for the loan component (i.e.,70% of capital cost) is 9.67%. For equity component (i.e.,30% of capital cost), the rate of Return on Equity (ROE) is considered at post-tax rate of 14%. Further, Corporate tax rate has been considered as 34.94%¹. Accordingly, the discount factor derived by this method for all technologies is 8.61% $[(9.67\% \times 0.70) \times (1 - 34.94\%) + (14.0\% \times 0.30)]$

G. Capital Cost

12. Regulation 12 of the RE Tariff Regulations specifies as under:

“12. Capital Cost

Norms for capital cost, as specified in relevant chapters of these regulations, shall be inclusive of land cost, pre-development expenses, all capital work including plant & machinery, civil work, erection, commissioning, financing cost, interest during construction, and evacuation infrastructure up to inter-connection point.”

13. The Commission has considered the normative capital cost as specified in RE Tariff Regulations, applicable for the first year of control period i.e. FY 2020-21, for various RE technologies viz. Small Hydro Power, Biomass Power based on Rankine cycle, Non-Fossil Fuel based Cogeneration, Biomass Gasifier and Biogas based power projects. The RE Technology specific capital cost of RE projects is discussed as under:

¹ Income Tax rate of 30% + 12% surcharge on IT rate +4% Health and Education cess on IT rate and Surcharge

Capital cost of Small Hydro Projects (SHP)

14. Small Hydro Projects for the purpose of the RE Tariff Regulations cover those projects which are located at the sites approved by the State Nodal Agencies/State Governments using new plant and machinery and with installed power plant capacity lower than or equal to 25 MW.
15. The Commission has specified the normative capital cost for small hydro projects for FY 2020-21 in accordance to Regulation 27 (1) as under:

Region	Projects Size	Capital Cost (Rs.Lakh/MW)
Himachal Pradesh, Uttarakhand,	Below 5 MW	1100
West Bengal, Union Territory of Jammu and Kashmir, Union Territory of Ladakh and North Eastern States	5 MW to 25 MW	1100
Others States	Below 5 MW	780
	5 MW to 25 MW	900

Capital cost of Biomass based Power Projects

16. The Commission, under Regulation 31 of the RE Tariff Regulations has specified the normative capital cost for Biomass based Power Projects for FY 2020-21, as under:

Biomass Rankine Cycle Projects	Capital Cost (Rs lakh/ MW)
Project [other than rice straw and juliflora (plantation) based project] with water cooled condenser	559
Project [other than rice straw and Juliflora(plantation) based project] with air cooled condenser	600
For rice straw and Juliflora (plantation) based project with water cooled condenser	611
For rice straw and Juliflora (plantation) based project with air cooled condenser	652

Capital cost of Non-fossil fuel based Cogeneration Projects

17. Non-fossil based cogeneration has been defined as the process in which more than one form of energy is produced in a sequential manner by using

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

18. The Commission, under Regulation 39, has specified normative capital cost for the Non-Fossil Fuel Based Cogeneration Projects as Rs. 492 lakh/MW for FY 2020-21. After taking into account the capital subsidy of Rs. 25 Lakh/MW, net project cost works out to be Rs. 467 lakh/MW for FY 2020-21.

Capital cost of Biomass Gasifier Power Projects

19. The Commission, under Regulation 50, has specified the normative capital cost for Biomass Gasifier power projects as Rs. 593 lakh/MW for FY 2020-21. After taking into account the capital subsidy of Rs. 150.00 lakh/MW (by Ministry of New and Renewable Energy), net project cost works out to be Rs. 443 lakh/MW for FY 2020-21.

Capital cost of Biogas based Power Projects

20. The Commission, under Regulation 56, has specified the normative capital cost for Biogas based power projects as Rs. 1186 lakh/MW for FY 2020-21. After taking into account the capital subsidy of Rs. 300 lakh/MW (by Ministry of New and Renewable Energy), net project cost works out to be Rs. 886 lakh/MW for FY 2020-21.
21. The capital cost for FY 2020-21 in respect of the renewable energy power generating stations is summarized as following:

Renewable Energy Projects	Net Capital Cost Norm for FY 2020-21 (Rs. lakh/MW)
Small Hydro	
Himachal Pradesh, Uttarakhand, West Bengal, Union Territory of Jammu and Kashmir, Union Territory of Ladakh and North Eastern States (Below 5 MW)	1100
Himachal Pradesh, Uttarakhand, West Bengal, Union Territory of Jammu and Kashmir, Union Territory of Ladakh and North Eastern States (5 MW to 25 MW)	1100
Other States (Below 5 MW)	780
Other States (5 MW to 25 MW)	900
Biomass Based	
Project [other than rice straw and Juliflora (plantation) based project] with water cooled condenser	559
Project [other than rice straw and Juliflora (plantation) based project] with air cooled condenser	600
Rice straw and Juliflora (plantation) based project with water cooled condenser	611
Rice straw and Juliflora (plantation) based project with air cooled condenser	652
Non-fossil fuel co-generation	467
Biomass Gasifier based Power Projects	443
Biogas based Power Projects	886

H. Debt-Equity Ratio

22. Sub-Regulation (1) of Regulation 13 of the RE Tariff Regulations, as stipulated below, specifies debt-equity ratio of 70:30 for determination of generic tariff based on suo-motu petition.

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

Renewable Energy Projects	Debt Amount (Rs. Lakh)	Equity Amount (Rs. Lakh)	Net Capital Cost (Rs. Lakh)
Small Hydro			
Himachal Pradesh, Uttarakhand, West Bengal, Union Territory of Jammu and Kashmir, Union Territory of Ladakh and North Eastern States. (Below 5 MW)	770.00	330.00	1,100.00
Himachal Pradesh, Uttarakhand, West Bengal, Union Territory of Jammu and Kashmir, Union Territory of Ladakh and North Eastern States. (5 MW to 25 MW)	770.00	330.00	1,100.00
Other States (Below 5 MW)	546.00	234.00	780.00
Other States (5 MW to 25 MW)	630.00	270.00	900.00
Biomass Based	-	-	
Project [other than rice straw and Juliflora (plantation) based project] with water cooled condenser	391.30	167.70	559.00
Project [other than rice straw and Juliflora (plantation) based project] with air cooled condenser	420.00	180.00	600.00
Rice straw and Juliflora (plantation) based project with water cooled condenser	427.70	183.30	611.00
Rice straw and Juliflora (plantation) based project with air cooled condenser	456.40	195.60	652.00
Non-fossil fuel co-generation	326.90	140.10	467.00
Biomass Gasifier based Power Projects	310.10	132.90	443.00
Biogas based Power Projects	620.20	265.80	886.00

I Return on Equity

24.As regards Rate of Return on Equity, sub-Regulation (2) of Regulation 16 of the RE Tariff Regulations specifies as under:

“16. Return on Equity

... ..

(2) The normative Return on Equity shall be 14%. The normative Return on Equity shall be grossed up by the latest available notified Minimum Alternate Tax (MAT) rate for the first 20 years of the Tariff Period and by the latest available notified Corporate Tax rate for the remaining Tariff Period.”

25.For computation of Rate of Return on Equity, MAT Rate of 17.47% and Corporate Tax Rate of 34.94% has been considered. Accordingly, Rate of Return has been computed as 16.96% for first 20 years and 21.52% after 20 years of useful life.

J. Interest on Loan

26.Sub-Regulation (1) of Regulation 14 of the RE Regulations specifies the loan tenure of 15 years for the purpose of determination of generic and project specific tariff for RE projects, which is reproduced as under:

“(a) The loans arrived at in the manner indicated in Regulation 13 shall be considered as gross normative loan for calculation for interest on loan.....

(b) For the purpose of computation of tariff, normative interest rate of two hundred (200) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months shall be considered.

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

27.The monthly data of MCLR for the last available six months from State Bank of India and the average MCLR is shown in following table:

Effective Date	One (1) Year Tenor MCLR rates²
10.12.2019 to 09.01.2020	7.90%
10.01.2020 to 09.02.2020	7.90%
10.02.2020 to 09.03.2020	7.85%
10.03.2020 to 09.04.2020	7.75%
10.04.2020 to 09.05.2020	7.40%
10.05.2020 to 09.06.2020	7.25%
Avg. for last Available 6 months	7.67%

² Source: <https://www.sbi.co.in/web/interest-rates/interest-rates/mclr-historical-data>

28. Accordingly, interest rate for loan component is determined as 9.67%.

K. Depreciation

29. Regulation 15 of the RE Tariff Regulations specifies for computation of depreciation in the following manner:

“(1) The value base for the purpose of depreciation shall be the capital cost of the project admitted by the Commission. The salvage value of the project shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the project”

Provided that, no depreciation shall be allowed to the extent of grant or capital subsidy received for the project.

(2) Depreciation rate of 4.67% per annum shall be considered for the first 15 years and remaining depreciation shall be evenly spread during remaining Useful Life of the project”

(3) Depreciation shall be computed from the first year of commercial operation:

Provided, that for determination of project specific tariff, in case of commercial operation of the project for part of the year, depreciation shall be computed on pro rata basis.”

30. In accordance with the above, the rate of depreciation for the first 15 years is specified as 4.67% and the rate of depreciation from the 16th year onwards is to be spread over the balance useful life of the RE project as under:

Details	Small Hydro	Biomass based	Non-Fossil Fuel cogeneration	Biomass Gasifier	Biogas
Useful Life (in years)	40	25	25	25	25
Rate of depreciation for 15 years (%)	4.67	4.67	4.67	4.67	4.67
Rate of depreciation from 16 th year onwards (%)	0.80%	2.00%	2.00%	2.00%	2.00%

L. Interest on Working Capital

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

“(1)The Working Capital requirement in respect of wind power projects, small hydro projects, solar PV power projects, floating solar projects, solar thermal power projects, and renewable energy with storage projects shall be computed in accordance with the following:

(d) Operation & Maintenance expenses for one month

(e) Receivables equivalent to 45 days of tariff for sale of electricity

calculated on normative Capacity Utilisation Factor or Plant Load Factor, as the case may be and

(f) Maintenance spares equivalent to 15% of Operation and Maintenance expenses.

(2) The Working Capital requirement in respect of biomass power projects with Rankine cycle technology, biogas power projects, biomass gasifier based power projects, non-fossil fuel based co-generation projects, municipal solid waste based power projects and refuse derived fuel based power projects shall be computed in accordance with the following

(e) Fuel costs for four months equivalent to normative Plant Load Factor:

(f) Operation and Maintenance expense for one month;

(g) Receivables equivalent to 45 days of tariff for sale of electricity calculated on the plant load factor; and

(h) Maintenance spares equivalent to 15% of Operation and Maintenance expenses.

(3) In case of renewable hybrid energy projects, the Working Capital requirement shall be sum of the Working Capital requirement determined as per norms applicable for renewable energy sources, in proportion to their rated capacity in the project

(4) Interest on Working Capital shall be at interest rate equivalent to the normative interest rate of three hundred and fifty (350) basis points above the average State Bank of India Marginal Cost of Funds based Lending Rate (MCLR) (one-year tenor) prevalent during the last available six months.”

32. Receivables equivalent to forty five (45) days of tariff for sale of electricity calculated on the plant load factor and four months of fuel cost, (as applicable for biomass power, non-fossil fuel based co- generation, biomass gasifier and biogas power) have been considered.

33. Interest rate has been computed as average of State Bank of India MCLR (One Year Tenor) prevalent during the last available six months plus 350 basis points (equivalent to interest rate of 11.17%).

34. The parameters considered for computation of the interest on working capital are stipulated in following table:

Details	Small Hydro	Biomass Based (Rankine Cycle), Non-Fossil Fuel Generation, Biomass Gasifier and Biogas.
For Fixed Charge		
O&M Expenses (Month)	1 month	1 month
Maintenance Spares (%) of O&M Expenses	15%	15%
Receivables (Days)	45 Days	45 Days
For Variable Charge		
Biomass/Bagasse Stock (Months)	-	4 months
Rate of Interest (%)	11.17%	11.17%

M. Operation and Maintenance Expenses

35.Regulation 19 of the RE Tariff Regulations specifies for Operation and Maintenance Expenses (O&M expenses) in respect of RE projects as following

"19. Operation and Maintenance Expenses

(1) *Operation and Maintenance expenses shall be determined for the Tariff Period of the project based on normative O&M expenses specified in these regulations for the first year of the Control Period."*

(2) *Normative O&M expenses allowed during first year of the Control Period i.e., financial year 2020-21 under these Regulations shall be escalated at the rate of 3.84% per annum over the Tariff Period."*

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

(f) **Small Hydro:** Regulation 30 of RE Regulations provide for the normative O&M expenses for small hydro projects for the first year of the Control Period (FY 2020-21), which shall be escalated at the rate of 3.84% per annum over the tariff period for determination of the levellised tariff. Accordingly, the table below represents the O&M cost for SHP as specified by the Commission for FY 2020-21:

Region	Project Size	O&M Expenses FY 2020-21 (Rs Lakh/ MW)
Himachal Pradesh, Uttarakhand, West Bengal, Union Territory of Jammu and Kashmir, Union Territory of Ladakh and North Eastern States	Below 5 MW	41.78
	5 MW to 25 MW	31.34
Other States	Below 5 MW	33.66
	5 MW to 25 MW	24.37

- (g) **Biomass Based:** Regulation 35 of RE Tariff Regulations provides that the normative O& M expenses for Biomass-based projects for first year of the Control Period (FY 2020-21) shall be Rs. 46.42 Lakh per MW
- (h) **Non-Fossil Fuel Cogeneration:** As per Regulation 45 of RE Tariff Regulations, the normative O&M expenses for non-fossil fuel co-generation projects for the first year of the Control Period (FY 2020-21) shall be Rs. 24.52 Lakh per MW.
- (i) **Biomass Gasifier:** As per Regulation 54 of the RE Tariff Regulations, normative O&M expenses for Biomass Gasifier power projects shall be Rs. 61.31 lakh/MW for the first year of Control Period (FY 2020-21).
- (j) **Biogas:** As per Regulation 59 of the RE Tariff Regulations, normative O&M expenses for biogas shall be Rs. 61.31 Lakh/MW for the first year of Control Period (FY2020-21).

37. The Commission has considered the normative O&M Expenses as specified in RE Tariff Regulations for different RE technologies as stated above.

N. Capacity Utilisation factor (CUF)/Plant Load Factor (PLF)

38. Regulation 18 of the RE Tariff Regulations, as defined below, specifies number of hours for calculation of CUF/PLF as 8766.

“The number of hours in a year for calculation of capacity utilization factor and plant load factor, as the case may be, shall be considered as 8766.”

39. Regulation 28 of the RE Tariff Regulations specifies the norms for Capacity

Utilization Factor (CUF) of units generated in a year in respect of the Small Hydro generating stations as per the details given in the table below:

Renewable Energy Projects	CUF (%)
Small Hydro	
(i) Himachal Pradesh, Uttarakhand, West Bengal, Union Territory of Jammu and Kashmir, Union Territory of Ladakh and North Eastern States.	45%
(ii) Other States	30%

40. In the present Order, the Commission has considered the CUF for small hydro projects as shown in the above Table.

41. Further, the Commission has considered the Plant Load Factor (PLF) for Biomass (Rankine Cycle), Biomass Gasifier, and Biogas based renewable energy generating stations as specified in Regulations 32, 51 and 57 of the RE Tariff Regulations, which are given in the following table:

Renewable Energy Projects	PLF (%)
(i) Biomass Based (Rankine Cycle)	80%
(ii) Biomass Gasifier	85%
(iii) Biogas	90%

42. Further, as regards Non-fossil Fuel based Co-generation projects, the Commission has considered PLF as specified in Regulation 40, which is given in the following Table:

States	PLF (%)
(i) Uttar Pradesh & Andhra Pradesh	45%
(ii) Tamil Nadu & Maharashtra	60%
(iii) Other States	53%

O. Auxiliary Consumption

43. The Commission has considered the Auxiliary Consumption as specified

Regulations 29, 33, 41, 52 and 58 of the RE Tariff Regulations, which is shown in the following Table:

Renewable Energy Projects	Auxiliary Consumption (%)
(i) Small Hydro	1.00%
(ii) Biomass Based Projects	
a) Using Water Cooled Condenser	10.00%
b) Using Air Cooled Condenser	12.00%
(iii) Non-Fossil Fuel Generation	8.50%
(iv) Biomass Gasifier	10.00%
(v) Biogas based	12.00%

P. Station Heat Rate

44. The Station Heat Rates (SHR) specified under Regulations 34 and 42 of the RE Tariff Regulations for biomass and non-fossil fuel based co-generation projects are as under:

Renewable Energy Projects	SHR (kcal/Kwh)
Biomass based	(a) 4200: For projects using travelling grate boilers (b) 4125: For Projects using AFBC boilers
Non-Fossil Fuel based Cogeneration	3600

Q. Fuel Parameters

(a) Fuel Mix

45. Regulation 53 of the RE Tariff Regulations specifies that the normative specific fuel consumption shall be 1.25 kg per kWh for Biomass Gasifier based power project.

46. Also, Regulation 60 of the RE Tariff Regulations specifies that the normative

specific fuel consumption shall be 3 kg of substrate mix per kWh for Biogas based power project.

47. The Commission has considered the fuel mix for Biomass Gasifier based power project and Biogas based power projects as specified above.

(b) Calorific Value

48. The Commission has considered the calorific value for biomass fuel used as 3100 kcal/kg as per Regulation 37 of the RE Tariff Regulations.

49. Also, the gross calorific value for bagasse in case of non-fossil fuel co-generation projects has been considered as 2250 kCal/kg as per Regulation 43 of RE Tariff Regulations, and for the use of biomass fuels other than bagasse, the calorific value as specified in above Para shall be applicable.

(c) Fuel Cost

50. The Commission, as per Regulation 38 of the RE Tariff Regulations, has specified the Biomass fuel price for first year of the Control Period (i.e. FY 2020-21) in the table below:

States	Biomass Price for FY 2020-21 (Rs/ MT)
Andhra Pradesh	3,326
Haryana	3,786
Maharashtra	3,872
Punjab	3,960
Rajasthan	3,305
Tamil Nadu	3,272
Telangana	3,326
Uttar Pradesh	3,384
Other States	3,557

51. The Commission, as per Regulation 44 (1) of the RE Tariff Regulations, has specified the Bagasse fuel price during first year of the Control Period (i.e. FY 2020-21) in the following table:

States	Bagasse Price for FY 2020-21 (Rs/ MT)
Andhra Pradesh	1,878
Haryana	2,671
Maharashtra	2,632

States	Bagasse Price for FY 2020-21 (Rs/ MT)
Punjab	2,351
Tamil Nadu	2,023
Telangana	1,877
Uttar Pradesh	2,095
Other States	2,274

52. As per Regulation 55 of the RE Tariff Regulations, the biomass fuel price for Biomass gasifier based power projects applicable for FY 2020-21 shall be the same as for biomass based power projects (Rankine cycle), as determined in accordance with Regulation 38 and as mentioned in Clause 50 of this Order

53. The Commission, as per Regulation 61 of the RE Tariff Regulations, has specified the feed stock price for Biogas based power projects during first year of the Control Period (FY 2020-21) at Rs.1422/MT.

R. Subsidy or Incentives by State/Central Government

54. Regulation 22 (1) of the RE Tariff Regulations provides as under:

"The Commission shall take into consideration any incentive, grant or subsidy from the Central or State Government, including accelerated depreciation benefit if availed by the project while determining the tariff under these Regulations.

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

"1) Assessment of benefit shall be based on normative capital cost, accelerated depreciation rate and corporate income tax rate as per relevant provisions under Income Tax Act as amended from time to time

2) Capitalization of Renewable energy projects during second half of the fiscal year

3) Per unit benefit shall be derived on levelled basis at discount factor equivalent to weighted average cost of capital"

55. Capital subsidy provided by the Government as per prevailing scheme/policy has already been considered, while considering the capital cost of the project.

56. In terms of the above regulation, for the projects availing the benefit of accelerated depreciation, an applicable Corporate tax rate of 34.94% has been considered. For the purpose of determining net depreciation benefits, depreciation @ 5.28% as per straight line method (Book depreciation as per

Companies Act, 1956) has been compared with depreciation as per Income Tax Act i.e. 40% of the written down value method. Moreover, additional 20% depreciation in the initial year is proposed to be extended to new assets acquired by power generation companies vide amendment in the section 32, sub-section (1) clause (iia) of the Income Tax Act.

57. Depreciation for the first year has been calculated at the rate of 50% of accelerated depreciation (40%) and 50% of additional depreciation (20%) (as project is capitalized during the second half of the financial year as per proviso to sub regulation (1) of Regulation 22). Income tax benefits of accelerated depreciation and additional depreciation, have been worked out as per normal tax rate on the net depreciation benefit. Per unit levelled accelerated depreciation benefit has been computed considering the post-tax weighted average cost of capital as discount factor. Accelerated depreciation benefit has been computed as per existing provisions of Income Tax Act.

58. In the light of the discussion made in the preceding paragraphs, the generic tariffs of different RE projects for the financial year 2020-21 have been arrived as follows:

GENERIC TARIFF FOR RE TECHNOLOGIES FOR FY 2020-21

59. The Generic Tariff for RE Technologies computed for FY 2020-21 is shown in the subsequent Tables:

Particulars	Levelling Total Tariff (FY 2020-21) (Rs/kWh)
Small Hydro Power Project	
Himachal Pradesh, Uttarakhand, West Bengal, North Eastern States and Union Territories of Jammu and Kashmir & Ladakh. (Below 5 MW)	5.16
Himachal Pradesh, Uttarakhand, West Bengal, North Eastern States and Union Territories of Jammu and Kashmir & Ladakh. (5 MW to 25 MW)	4.72
Others States (Below 5 MW)	5.74
Others States (5 MW to 25 MW)	5.71

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and travelling grate boiler					
AP	2.61	5.01	7.62	0.12	7.50
Haryana	2.67	5.70	8.37	0.12	8.25
Maharashtra	2.68	5.83	8.51	0.12	8.39
Punjab	2.69	5.96	8.65	0.12	8.53
Rajasthan	2.61	4.98	7.58	0.12	7.47
Tamil Nadu	2.60	4.93	7.53	0.12	7.41
Telangana	2.61	5.01	7.62	0.12	7.50
UP	2.62	5.09	7.71	0.12	7.60
Others	2.64	5.35	7.99	0.12	7.88

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Air Cooled Condenser and travelling grate boiler					
AP	2.75	5.12	7.88	0.13	7.75
Haryana	2.81	5.83	8.64	0.13	8.51
Maharashtra	2.82	5.96	8.78	0.13	8.66
Punjab	2.83	6.10	8.93	0.13	8.80
Rajasthan	2.75	5.09	7.84	0.13	7.71
Tamil Nadu	2.75	5.04	7.79	0.13	7.66
Telangana	2.75	5.12	7.88	0.13	7.75
UP	2.76	5.21	7.97	0.13	7.84
Others	2.78	5.48	8.26	0.13	8.13

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
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State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Biomass Power Projects [Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and travelling grate boiler					
AP	2.72	5.01	7.72	0.13	7.60
Haryana	2.77	5.70	8.47	0.13	8.34
Maharashtra	2.78	5.83	8.61	0.13	8.48
Punjab	2.79	5.96	8.75	0.13	8.63
Rajasthan	2.71	4.98	7.69	0.13	7.56
Tamil Nadu	2.71	4.93	7.63	0.13	7.51
Telangana	2.72	5.01	7.72	0.13	7.60
UP	2.72	5.09	7.82	0.13	7.69
Others	2.74	5.35	8.10	0.13	7.97

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Biomass Power Projects [Rice Straw and Juliflora (plantation) based project] with Air Cooled Condenser and travelling grate boiler					
AP	2.86	5.12	7.98	0.14	7.85
Haryana	2.92	5.83	8.75	0.14	8.61
Maharashtra	2.93	5.96	8.89	0.14	8.75
Punjab	2.94	6.10	9.04	0.14	8.90
Rajasthan	2.86	5.09	7.95	0.14	7.81
Tamil Nadu	2.86	5.04	7.89	0.14	7.76
Telangana	2.86	5.12	7.98	0.14	7.85
UP	2.87	5.21	8.08	0.14	7.94
Others	2.89	5.48	8.37	0.14	8.23

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and AFBC boiler					
AP	2.60	4.92	7.52	0.12	7.40
Haryana	2.66	5.60	8.26	0.12	8.14
Maharashtra	2.67	5.72	8.39	0.12	8.28
Punjab	2.68	5.85	8.53	0.12	8.42
Rajasthan	2.60	4.89	7.49	0.12	7.37
Tamil Nadu	2.60	4.84	7.43	0.12	7.32
Telangana	2.60	4.92	7.52	0.12	7.40
UP	2.61	5.00	7.61	0.12	7.50
Others	2.63	5.26	7.89	0.12	7.77

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Air Cooled Condenser and AFBC boiler					
AP	2.75	5.03	7.78	0.13	7.65
Haryana	2.80	5.72	8.53	0.13	8.40
Maharashtra	2.81	5.85	8.67	0.13	8.54
Punjab	2.82	5.99	8.81	0.13	8.69
Rajasthan	2.74	5.00	7.74	0.13	7.62
Tamil Nadu	2.74	4.95	7.69	0.13	7.56
Telangana	2.75	5.03	7.78	0.13	7.65
UP	2.75	5.12	7.87	0.13	7.74
Others	2.78	5.38	8.15	0.13	8.03

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Biomass Power Projects [Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and AFBC boiler					
AP	2.71	4.92	7.63	0.13	7.50
Haryana	2.76	5.60	8.36	0.13	8.23
Maharashtra	2.77	5.72	8.50	0.13	8.37
Punjab	2.78	5.85	8.64	0.13	8.51
Rajasthan	2.71	4.89	7.59	0.13	7.47
Tamil Nadu	2.70	4.84	7.54	0.13	7.41
Telangana	2.71	4.92	7.63	0.13	7.50
UP	2.72	5.00	7.72	0.13	7.59
Others	2.74	5.26	8.00	0.13	7.87

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Biomass Power Projects [Rice Straw and Juliflora (plantation) based project] with Air Cooled Condenser and AFBC boiler					
AP	2.86	5.03	7.88	0.14	7.75
Haryana	2.91	5.72	8.64	0.14	8.50
Maharashtra	2.92	5.85	8.78	0.14	8.64
Punjab	2.93	5.99	8.92	0.14	8.78
Rajasthan	2.85	5.00	7.85	0.14	7.71
Tamil Nadu	2.85	4.95	7.80	0.14	7.66
Telangana	2.86	5.03	7.88	0.14	7.75
UP	2.86	5.12	7.98	0.14	7.84
Others	2.88	5.38	8.26	0.14	8.12

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Bagasse Based Co-generation Project					
AP	2.91	3.28	6.20	0.17	6.03
Haryana	2.63	4.67	7.30	0.14	7.15
Maharashtra	2.36	4.60	6.96	0.13	6.83
Punjab	2.58	4.11	6.69	0.14	6.55
Tamil Nadu	2.27	3.54	5.81	0.13	5.68
Telangana	2.51	3.28	5.80	0.14	5.65
UP	2.94	3.66	6.61	0.17	6.44
Others	2.57	3.98	6.55	0.14	6.40

State	Levelling Fixed Cost	Variable Cost (FY 2020-21)	Applicable Tariff Rates (FY 2020-21)	Benefit of Accelerated Depreciation (if availed)	Net levellised tariff (upon adjusting for Accelerated Depreciation Benefit) (if availed)
	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)	(Rs/kWh)
Biomass Gasifier Power Project					
AP	2.55	4.62	7.17	0.09	7.08
Haryana	2.60	5.26	7.86	0.09	7.77
Maharashtra	2.61	5.38	7.99	0.09	7.90
Punjab	2.62	5.50	8.12	0.09	8.03
Rajasthan	2.55	4.59	7.14	0.09	7.05
Tamil Nadu	2.54	4.54	7.09	0.09	7.00
Telangana	2.55	4.62	7.17	0.09	7.08
UP	2.56	4.70	7.26	0.09	7.17
Others	2.58	4.94	7.52	0.09	7.43
Biogas based generation					
Biogas	3.31	4.85	8.16	0.17	7.99

60. The detailed computations for the generic tariff for various RE technologies have been enclosed with this draft Order as per the details given hereunder:

Sl. No.	<u>Renewable Energy Projects</u>	<u>Annexure</u>
A	Small Hydro Power Projects	
	<i>Projects Less than 5 MW for HP, Uttarakhand, West Bengal, Jammu and Kashmir, Ladakh and NE States</i>	<i>Annexure 1A</i>
	<i>Projects between 5 MW and 25 MW for HP, Uttarakhand, West Bengal, Jammu and Kashmir, Ladakh and NE States</i>	<i>Annexure 1B</i>
	<i>Projects less than 5 MW for other States</i>	<i>Annexure 1C</i>
	<i>Projects between 5 MW and 25 MW for other states</i>	<i>Annexure 1D</i>
B.1	Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and using Travelling Grate	
	<i>Andhra Pradesh</i>	<i>Annexure 2.1A</i>
	<i>Haryana</i>	<i>Annexure 2.1B</i>
	<i>Maharashtra</i>	<i>Annexure 2.1C</i>
	<i>Punjab</i>	<i>Annexure 2.1D</i>
	<i>Rajasthan</i>	<i>Annexure 2.1E</i>
	<i>Tamil Nadu</i>	<i>Annexure 2.1F</i>
	<i>Telangana</i>	<i>Annexure 2.1G</i>
	<i>Uttar Pradesh</i>	<i>Annexure 2.1H</i>
	<i>Others</i>	<i>Annexure 2.1I</i>
B.2	Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Air Cooled Condenser and using Travelling Grate boiler	
	<i>Andhra Pradesh</i>	<i>Annexure 2.2A</i>
	<i>Haryana</i>	<i>Annexure 2.2B</i>
	<i>Maharashtra</i>	<i>Annexure 2.2C</i>
	<i>Punjab</i>	<i>Annexure 2.2D</i>
	<i>Rajasthan</i>	<i>Annexure 2.2E</i>
	<i>Tamil Nadu</i>	<i>Annexure 2.2F</i>
	<i>Telangana</i>	<i>Annexure 2.2G</i>
	<i>Uttar Pradesh</i>	<i>Annexure 2.2H</i>
	<i>Others</i>	<i>Annexure 2.2I</i>

Sl. No.	Renewable Energy Projects	Annexure
B.3	Biomass Power Projects [Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and using Travelling Grate boiler	
	<i>Andhra Pradesh</i>	<i>Annexure 2.3A</i>
	<i>Haryana</i>	<i>Annexure 2.3B</i>
	<i>Maharashtra</i>	<i>Annexure 2.3C</i>
	<i>Punjab</i>	<i>Annexure 2.3D</i>
	<i>Rajasthan</i>	<i>Annexure 2.3E</i>
	<i>Tamil Nadu</i>	<i>Annexure 2.3F</i>
	<i>Telangana</i>	<i>Annexure 2.3G</i>
	<i>Uttar Pradesh</i>	<i>Annexure 2.3H</i>
	<i>Others</i>	<i>Annexure 2.3I</i>
B.4	Biomass Power Projects [Rice Straw and Juliflora (plantation) based project] with Air Cooled Condenser and using Travelling Grate boiler	
	<i>Andhra Pradesh</i>	<i>Annexure 2.4A</i>
	<i>Haryana</i>	<i>Annexure 2.4B</i>
	<i>Maharashtra</i>	<i>Annexure 2.4C</i>
	<i>Punjab</i>	<i>Annexure 2.4D</i>
	<i>Rajasthan</i>	<i>Annexure 2.4E</i>
	<i>Tamil Nadu</i>	<i>Annexure 2.4F</i>
	<i>Telangana</i>	<i>Annexure 2.4G</i>
	<i>Uttar Pradesh</i>	<i>Annexure 2.4H</i>
	<i>Others</i>	<i>Annexure 2.4I</i>
B.5	Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and using AFBC boiler	
	<i>Andhra Pradesh</i>	<i>Annexure 2.5A</i>
	<i>Haryana</i>	<i>Annexure 2.5B</i>
	<i>Maharashtra</i>	<i>Annexure 2.5C</i>
	<i>Punjab</i>	<i>Annexure 2.5D</i>
	<i>Rajasthan</i>	<i>Annexure 2.5E</i>
	<i>Tamil Nadu</i>	<i>Annexure 2.5F</i>
	<i>Telangana</i>	<i>Annexure 2.5G</i>
	<i>Uttar Pradesh</i>	<i>Annexure 2.5H</i>
	<i>Others</i>	<i>Annexure 2.5I</i>
B.6	Biomass Power Projects [other than Rice Straw and Juliflora (plantation) based project] with Air	

Sl. No.	Renewable Energy Projects	Annexure
	Cooled Condenser and using AFBC	
	<i>Andhra Pradesh</i>	<i>Annexure 2.6A</i>
	<i>Haryana</i>	<i>Annexure 2.6B</i>
	<i>Maharashtra</i>	<i>Annexure 2.6C</i>
	<i>Punjab</i>	<i>Annexure 2.6D</i>
	<i>Rajasthan</i>	<i>Annexure 2.6E</i>
	<i>Tamil Nadu</i>	<i>Annexure 2.6F</i>
	<i>Telangana</i>	<i>Annexure 2.6G</i>
	<i>Uttar Pradesh</i>	<i>Annexure 2.6H</i>
	<i>Others</i>	<i>Annexure 2.6I</i>
B.7	Biomass Power Projects [Rice Straw and Juliflora (plantation) based project] with Water Cooled Condenser and using AFBC boiler	
	<i>Andhra Pradesh</i>	<i>Annexure 2.7A</i>
	<i>Haryana</i>	<i>Annexure 2.7B</i>
	<i>Maharashtra</i>	<i>Annexure 2.7C</i>
	<i>Punjab</i>	<i>Annexure 2.7D</i>
	<i>Rajasthan</i>	<i>Annexure 2.7E</i>
	<i>Tamil Nadu</i>	<i>Annexure 2.7F</i>
	<i>Telangana</i>	<i>Annexure 2.7G</i>
	<i>Uttar Pradesh</i>	<i>Annexure 2.7H</i>
	<i>Others</i>	<i>Annexure 2.7I</i>
B.8	Biomass Power Projects [Rice Straw and Juliflora (plantation) based project] with Air Cooled Condenser and using AFBC boiler	
	<i>Andhra Pradesh</i>	<i>Annexure 2.8A</i>
	<i>Haryana</i>	<i>Annexure 2.8B</i>
	<i>Maharashtra</i>	<i>Annexure 2.8C</i>
	<i>Punjab</i>	<i>Annexure 2.8D</i>
	<i>Rajasthan</i>	<i>Annexure 2.8E</i>
	<i>Tamil Nadu</i>	<i>Annexure 2.8F</i>
	<i>Telangana</i>	<i>Annexure 2.8G</i>
	<i>Uttar Pradesh</i>	<i>Annexure 2.8H</i>
	<i>Others</i>	<i>Annexure 2.8I</i>
C	Non-Fossil Fuel Based Cogeneration	
	<i>Andhra Pradesh</i>	<i>Annexure 3A</i>
	<i>Haryana</i>	<i>Annexure 3B</i>

Sl. No.	Renewable Energy Projects	Annexure
	<i>Maharashtra</i>	<i>Annexure 3C</i>
	<i>Punjab</i>	<i>Annexure 3D</i>
	<i>Tamil Nadu</i>	<i>Annexure 3E</i>
	<i>Telangana</i>	<i>Annexure 3F</i>
	<i>Uttar Pradesh</i>	<i>Annexure 3G</i>
	<i>Others</i>	<i>Annexure 3H</i>
D	Biomass Gasifier Power Projects	
	<i>Andhra Pradesh</i>	<i>Annexure 4A</i>
	<i>Haryana</i>	<i>Annexure 4B</i>
	<i>Maharashtra</i>	<i>Annexure 4C</i>
	<i>Punjab</i>	<i>Annexure 4D</i>
	<i>Rajasthan</i>	<i>Annexure 4E</i>
	<i>Tamil Nadu</i>	<i>Annexure 4F</i>
	<i>Telangana</i>	<i>Annexure 4G</i>
	<i>Uttar Pradesh</i>	<i>Annexure 4H</i>
	<i>Others</i>	<i>Annexure 4I</i>
E	Biogas Power Projects	<i>Annexure 5A</i>

Assumption for Small Hydro based Project Parameters			Himachal Pradesh, Uttarakhand, WB, UT of J&K, Ladakh, North Eastern States - <=5MW		
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Parameter
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Aux Consumption	%	1.00%
			Capacity Utilization Factor	%	45%
			Useful Life	Years	40
2	Project Cost	Capital Cost	Normative Capital Cost	Rs. Lakh/MW	1100.00
			Capital Cost	Rs. Lakh	1100
			Capital Subsidy	Rs. Lakh	0
			Net Capital Cost	Rs. Lakh	1100.00
3	Financial Assumption	Debt Equity	Tariff Period	Years	40
			Debt	%	70%
			Equity	%	30%
		Debt Component	Total Debt Amount	Rs. Lakh	770.00
			Total Equity Amount	Rs. Lakh	330.00
			Loan Amount	Rs. Lakh	770.00
			Moratorium Period	Years	0
			Repayment Period (including Moratorium)	Years	15
			Interest Rate	%	9.67%
		Equity Component	Equity Amount	Rs. Lakh	330.00
			Return on Equity for First 20 years	% p.a	16.96%
			Return on Equity after 20 years	% p.a	21.52%
			Discount Rate	%	8.61%
		Tax Rate	Corporate Tax Rate	%	34.94%
MAT Rate	%		17.47%		
Depreciation	Depreciation Rate for 1st 15 years	%	4.67%		
	Depreciation Rate 16th years onwards	%	0.80%		
4	O&M Expenses	Normative O&M expense	Rs. Lakh/MW	41.78	
		O&M expenses p.a	Rs. Lakh	41.78	
		Escalation factor	%	3.84%	
5	Working Capital	O&M expenses p.a	Month	1	
		Maintenance Spares	% of O&M expenses	15.00%	
		Receivables	Days	1.5	
		Interest on Working Capital	% per annum	11.17%	
6	Generation and Sale of Power	Number of Hours	Hours	8766.00	

CERC RE Tariff Order FY 2020-21

Determination of Tariff Components - Small Hydro Based Power Project

Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Net Generation	MU		3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91

Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
OM Expenditures	Rs Lakh		41.78	43.38	45.05	46.78	48.57	50.43	52.37	54.38	56.47	58.63	60.88	63.22	65.64	68.16	70.78	73.49	76.31	79.24	82.28	85.44	88.72	92.12	95.66	99.33	103.14	107.10	111.20	115.47	119.90	124.50	129.28	134.24	139.39	144.74	150.29	156.06	162.05	168.27	174.72	181.43		
Depreciation	Rs Lakh		51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80
Interest on term loan	Rs Lakh		72.01	67.04	62.08	57.11	52.15	47.18	42.21	37.25	32.28	27.31	22.35	17.38	12.42	7.45	2.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		4.24	4.23	4.23	4.23	4.23	4.24	4.24	4.26	4.27	4.29	4.31	4.33	4.36	4.39	4.43	3.90	4.02	4.14	4.26	4.39	4.73	4.87	5.02	5.16	5.32	5.48	5.65	5.82	6.00	6.19	6.38	6.58	6.79	7.01	7.23	7.47	7.71	7.96	8.23	8.50		
Return on Equity	Rs Lakh		55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02
Total Fixed Cost	Rs Lakh		225.34	221.97	218.67	215.43	212.26	209.17	206.14	203.20	200.33	197.55	194.85	192.25	189.74	187.32	185.01	142.18	145.11	148.16	151.32	154.61	173.27	176.81	180.49	184.31	188.27	192.39	196.67	201.11	205.72	210.51	215.48	220.64	226.00	231.56	237.34	243.34	249.58	256.05	262.76	269.74		

Levelised tariff corresponding to Useful life																																											
Per Unit Cost of Generation	Unit		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
OMI expn	Rs/KWh	1.67	1.07	1.11	1.15	1.20	1.24	1.29	1.34	1.39	1.45	1.50	1.56	1.62	1.68	1.75	1.81	1.88	1.95	2.03	2.11	2.19	2.27	2.36	2.45	2.54	2.64	2.74	2.85	2.96	3.07	3.19	3.31	3.44	3.57	3.71	3.85	4.00	4.15	4.31	4.47	4.65	
Depreciation	Rs/KWh	1.03	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Int. on term loan	Rs/KWh	0.84	1.84	1.72	1.59	1.46	1.34	1.21	1.08	0.95	0.83	0.70	0.57	0.45	0.32	0.19	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/KWh	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.18	0.19	0.19	0.20	0.20	0.21	0.22	
RoE	Rs/KWh	1.50	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82
Total COG	Rs/KWh	5.16	5.77	5.68	5.60	5.52	5.44	5.36	5.28	5.20	5.13	5.06	4.99	4.92	4.86	4.80	4.74	3.64	3.72	3.79	3.87	3.96	4.44	4.53	4.62	4.72	4.82	4.93	5.04	5.15	5.27	5.39	5.52	5.65	5.79	5.93	6.08	6.23	6.39	6.56	6.73	6.91	

Levelised Tariff - FY 2020-21	5.16	Rs/KWh
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Assumption for Small Hydro based Project Parameters			Himachal Pradesh, Uttarakhand, WB, UT of J&K, Ladakh, North Eastern States - >5 MW upto 25MW		
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Parameter
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Aux Consumption	%	1.00%
			Capacity Utilization Factor	%	45%
			Useful Life	Years	40
2	Project Cost	Capital Cost	Normative Capital Cost	Rs. Lakh/MW	1100.00
			Capital Cost	Rs. Lakh	1100
			Capital Subsidy	Rs. Lakh	0
			Net Capital Cost	Rs. Lakh	1100.00
3	Financial Assumption	Debt Equity	Tariff Period	Years	40
			Debt	%	70%
			Equity	%	30%
		Debt Component	Total Debt Amount	Rs. Lakh	770.00
			Total Equity Amount	Rs. Lakh	330.00
			Loan Amount	Rs. Lakh	770.00
			Moratorium Period	Years	0
			Repayment Period (including Moratorium)	Years	15
			Interest Rate	%	9.67%
		Equity Component	Equity Amount	Rs. Lakh	330.00
			Return on Equity for First 20 years	% p.a	16.96%
			Return on Equity after 20 years	% p.a	21.52%
			Discount Rate	%	8.61%
		Tax Rate	Corporate Tax Rate	%	34.94%
MAT Rate	%		17.47%		
Depreciation	Depreciation Rate for 1st 15 years	%	4.67%		
	Depreciation Rate 16th years onwards	%	0.80%		
4	O&M Expenses	Normative O&M expense	Rs. Lakh/MW	31.34	
		O&M expenses p.a	Rs. Lakh	31.34	
		Escalation factor	%	3.84%	
5	Working Capital	O&M expenses p.a	Month	1	
		Maintenance Spares	% of O&M expenses	15.00%	
		Receivables	Days	1.5	
		Interest on Working Capital	% per annum	11.17%	
6	Generation and Sale of Power	Number of Hours	Hours	8766.00	

CERC RE Tariff Order FY 2020-21

Determination of Tariff Components Small Hydro Based Power Project

Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Net Generation	MU		3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91	3.91

Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
OM Expenses	Rs Lakh		31.34	32.54	33.79	35.09	36.43	37.83	39.28	40.79	42.36	43.98	45.67	47.42	49.24	51.13	53.09	55.13	57.24	59.44	61.72	64.09	66.55	69.10	71.75	74.51	77.37	80.33	83.42	86.62	89.94	93.39	96.98	100.70	104.56	108.57	112.74	117.06	121.56	126.22	131.06	136.09		
Depreciation	Rs Lakh		51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	51.33	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80	8.80
Interest on term loan	Rs Lakh		72.01	67.04	62.08	57.11	52.15	47.18	42.21	37.25	32.28	27.31	22.35	17.38	12.42	7.45	2.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		3.81	3.79	3.77	3.75	3.74	3.72	3.71	3.70	3.70	3.69	3.69	3.69	3.70	3.70	3.71	3.16	3.24	3.33	3.42	3.52	3.63	3.94	4.04	4.16	4.27	4.39	4.52	4.65	4.78	4.92	5.07	5.22	5.38	5.54	5.71	5.88	6.07	6.26	6.45	6.66		
Return on Equity	Rs Lakh		55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	55.98	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02	71.02
Total Fixed Cost	Rs Lakh		214.48	210.69	206.96	203.27	199.63	196.05	192.52	189.06	185.65	182.30	179.02	175.81	172.67	169.60	166.60	123.07	125.27	127.55	129.93	132.39	150.20	152.86	155.61	158.48	161.45	164.54	167.75	171.08	174.54	178.13	181.86	185.73	189.75	193.93	198.26	202.76	207.44	212.29	217.33	222.56		

Levelised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
OM exgn	Rs/KWh	1.25	0.80	0.83	0.87	0.90	0.93	0.97	1.01	1.04	1.08	1.13	1.17	1.21	1.26	1.31	1.36	1.41	1.47	1.52	1.58	1.64	1.70	1.77	1.84	1.91	1.98	2.06	2.14	2.22	2.30	2.39	2.48	2.58	2.68	2.78	2.89	3.00	3.11	3.23	3.36	3.48	
Depreciation	Rs/KWh	1.03	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	1.31	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Int. on term loan	Rs/KWh	0.84	1.84	1.72	1.59	1.46	1.34	1.21	1.08	0.95	0.83	0.70	0.57	0.45	0.32	0.19	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/KWh	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.10	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.10	0.11	0.11	0.11	0.12	0.12	0.12	0.13	0.13	0.13	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	
RoE	Rs/KWh	1.50	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82
Total COG	Rs/KWh	4.72	5.49	5.40	5.30	5.21	5.11	5.02	4.93	4.84	4.75	4.67	4.58	4.50	4.42	4.34	4.27	3.15	3.21	3.27	3.33	3.39	3.85	3.91	3.98	4.06	4.13	4.21	4.30	4.38	4.47	4.56	4.66	4.76	4.86	4.97	5.08	5.19	5.31	5.44	5.57	5.70	

Levelised Tariff-FY 2020-21	4.72	Rs/KWh
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Assumption for Small Hydro based Project Parameters		Other States - <= 5 MW			
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Parameter
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Aux Consumption	%	1.00%
			Capacity Utilization Factor	%	30%
			Useful Life	Years	40
2	Project Cost	Capital Cost	Normative Capital Cost	Rs. Lakh/MW	780.00
			Capital Cost	Rs. Lakh	780
			Capital Subsidy	Rs. Lakh	0
			Net Capital Cost	Rs. Lakh	780.00
3	Financial Assumption	Debt Equity	Tariff Period	Years	40
			Debt	%	70%
			Equity	%	30%
		Debt Component	Total Debt Amount	Rs. Lakh	546.00
			Total Equity Amount	Rs. Lakh	234.00
			Loan Amount	Rs. Lakh	546.00
			Moratorium Period	Years	0
			Repayment Period (including Moratorium)	Years	15
			Interest Rate	%	9.67%
		Equity Component	Equity Amount	Rs. Lakh	234.00
			Return on Equity for First 20 years	% p.a	16.96%
			Return on Equity after 20 years	% p.a	21.52%
			Discount Rate	%	8.61%
		Tax Rate	Corporate Tax Rate	%	34.94%
MAT Rate	%		17.47%		
Depreciation	Depreciation Rate for 1st 15 years	%	4.67%		
	Depreciation Rate 16th years onwards	%	0.80%		
4	O&M Expenses	Normative O&M expense		Rs. Lakh/MW	33.66
		O&M expenses p.a		Rs. Lakh	33.66
		Escalation factor		%	3.84%
5	Working Capital	O&M expenses p.a		Month	1
		Maintenance Spares	% of O&M expenses	%	15.00%
		Receivables		Days	1.5
		Interest on Working Capital		% per annum	11.17%
6	Generation and Sale of Power	Number of Hours		Hours	8766.00

CERC RE Tariff Order FY 2020-21

Determination of Tariff Components - Small Hydro Based Power Project

Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Net Generation	MU		2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60

Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40					
Capex Expenses	Rs Lakh		33.66	34.95	36.29	37.69	39.13	40.63	42.19	43.81	45.49	47.24	49.05	50.93	52.89	54.92	57.02	59.21	61.48	63.84	66.29	68.83	71.48	74.22	77.07	80.02	83.09	86.28	89.59	93.03	96.60	100.31	104.15	108.15	112.30	116.61	121.08	125.73	130.55	135.56	140.77	146.17					
Depreciation	Rs Lakh		36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40	36.40			
Interest on term loan	Rs Lakh		51.06	47.54	44.02	40.50	36.98	33.45	29.93	26.41	22.89	19.37	15.85	12.33	8.80	5.28	1.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Interest on working Capital	Rs Lakh		3.17	3.17	3.18	3.18	3.19	3.20	3.22	3.23	3.25	3.27	3.29	3.32	3.35	3.38	3.42	3.06	3.15	3.24	3.34	3.45	3.70	3.82	3.93	4.05	4.18	4.31	4.44	4.58	4.72	4.88	5.02	5.19	5.36	5.54	5.72	5.91	6.10	6.31	6.52	6.74					
Return on Equity	Rs Lakh		39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70	39.70		
Total Fixed Cost	Rs Lakh		163.99	161.76	159.58	157.46	155.39	153.38	151.44	149.55	147.73	145.97	144.29	142.67	141.14	139.68	138.30	136.99	135.74	134.54	133.39	132.28	131.21	130.18	129.18	128.21	127.27	126.36	125.47	124.60	123.76	122.94	122.14	121.36	120.60	119.87	119.16	118.47	117.80	117.15	116.52	115.91	115.31	114.73	114.17	113.62	113.08

Levelised tariff corresponding to Useful life

Per Unit Cost of Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40						
Capex	Rs/kWh	2.02	1.29	1.34	1.39	1.45	1.50	1.56	1.62	1.68	1.75	1.81	1.88	1.96	2.03	2.11	2.19	2.27	2.36	2.45	2.55	2.64	2.75	2.85	2.96	3.07	3.19	3.31	3.44	3.57	3.71	3.85	4.00	4.15	4.31	4.48	4.65	4.83	5.01	5.21	5.41	5.61					
Depreciation	Rs/kWh	1.09	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40	
Int. on term loan	Rs/kWh	0.90	1.96	1.83	1.69	1.56	1.42	1.28	1.15	1.01	0.88	0.74	0.61	0.47	0.34	0.20	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.13	0.13	0.13	0.13	0.13	0.13	0.12	0.12	0.12	0.13	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.21	0.21	0.22	0.23	0.23	0.24	0.25	0.26						
RoE	Rs/kWh	1.59	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52
Total COG	Rs/kWh	5.74	6.30	6.21	6.13	6.05	5.97	5.89	5.82	5.74	5.67	5.61	5.54	5.48	5.42	5.36	5.31	5.26	5.21	5.16	5.11	5.06	5.01	4.96	4.91	4.86	4.81	4.76	4.71	4.66	4.61	4.56	4.51	4.46	4.41	4.36	4.31	4.26	4.21	4.16	4.11	4.06	4.01	3.96	3.91	3.86	3.81

Levelised Tariff-FY 2020-21	5.74	Rs/kWh
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Assumption for Small Hydro based Project Parameters			Other States - >5 MW upto 25MW		
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Parameter
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Aux Consumption	%	1.00%
			Capacity Utilization Factor	%	30%
			Useful Life	Years	40
2	Project Cost	Capital Cost	Normative Capital Cost	Rs. Lakh/MW	900.00
			Capital Cost	Rs. Lakh	900
			Capital Subsidy	Rs. Lakh	0
			Net Capital Cost	Rs. Lakh	900.00
3	Financial Assumption	Debt Equity	Tariff Period	Years	40
			Debt	%	70%
			Equity	%	30%
		Debt Component	Total Debt Amount	Rs. Lakh	630.00
			Total Equity Amount	Rs. Lakh	270.00
			Loan Amount	Rs. Lakh	630.00
			Moratorium Period	Years	0
			Repayment Period (including Moratorium)	Years	15
		Equity Component	Interest Rate	%	9.67%
			Equity Amount	Rs. Lakh	270.00
			Return on Equity for First 20 years	% p.a	16.96%
			Return on Equity after 20 years	% p.a	21.52%
		Tax Rate	Discount Rate	%	8.61%
			Corporate Tax Rate	%	34.94%
Depreciation	MAT Rate	%	17.47%		
	Depreciation Rate for 1st 15 years	%	4.67%		
4	O&M Expenses		Depreciation Rate 16th years onwards	%	0.80%
			Normative O&M expense	Rs. Lakh/MW	24.37
			O&M expenses p.a	Rs. Lakh	24.37
5	Working Capital		Escalation factor	%	3.84%
			O&M expenses p.a	Month	1
			Maintenance Spares	% of O&M expenses	15.00%
			Receivables	Days	1.5
6	Generation and Sale of Power	Number of Hours	Interest on Working Capital	% per annum	11.17%
				Hours	8766.00

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Determination of Tariff Components Small Hydro Based Power Project

Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40			
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		
Net Generation	MU		2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60	2.60

Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40			
O&M Expenses	Rs Lakh		24.37	25.31	26.28	27.28	28.33	29.42	30.55	31.72	32.94	34.20	35.51	36.87	38.29	39.76	41.28	42.87	44.51	46.22	47.99	49.84	51.75	53.73	55.80	57.94	60.16	62.47	64.87	67.35	69.94	72.62	75.41	78.30	81.31	84.43	87.67	91.03	94.52	98.15	101.91	105.83			
Depreciation	Rs Lakh		42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00	42.00
Interest on term loan	Rs Lakh		58.92	54.85	50.79	46.73	42.66	38.60	34.54	30.47	26.41	22.35	18.28	14.22	10.16	6.09	2.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working capital	Rs Lakh		3.07	3.05	3.03	3.01	3.00	2.99	2.97	2.96	2.95	2.94	2.94	2.94	2.94	2.94	2.94	2.95	2.49	2.56	2.63	2.70	2.77	3.03	3.11	3.19	3.28	3.37	3.46	3.56	3.66	3.77	3.87	3.99	4.10	4.23	4.35	4.49	4.62	4.76	4.91	5.06	5.22		
Return on Equity	Rs Lakh		45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80	45.80
Total Fixed Cost	Rs Lakh		174.16	171.01	167.90	164.83	161.80	158.81	155.86	152.96	150.11	147.30	144.54	141.84	139.19	136.60	134.07	98.36	100.07	101.85	103.70	105.61	120.08	122.15	124.29	126.52	128.83	131.23	133.73	136.32	139.01	141.80	144.70	147.71	150.84	154.08	157.45	160.95	164.59	168.36	172.28	176.35			

Per Unit Cost of Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40			
O&M expn	Rs/KWh		1.46	0.94	0.97	1.01	1.05	1.09	1.13	1.17	1.22	1.27	1.31	1.36	1.42	1.47	1.53	1.59	1.65	1.71	1.78	1.84	1.91	1.99	2.06	2.14	2.23	2.31	2.40	2.49	2.59	2.69	2.79	2.90	3.01	3.12	3.24	3.37	3.50	3.63	3.77	3.91	4.06		
Depreciation	Rs/KWh		1.26	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	
Int. on term loan	Rs/KWh		1.04	2.26	2.11	1.95	1.79	1.64	1.48	1.33	1.17	1.01	0.86	0.70	0.55	0.39	0.23	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/KWh		0.12	0.12	0.12	0.12	0.12	0.12	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.10	0.10	0.10	0.10	0.10	0.11	0.12	0.12	0.12	0.13	0.13	0.14	0.14	0.14	0.15	0.15	0.16	0.16	0.17	0.17	0.18	0.18	0.19	0.19	0.20	0.20		
RoE	Rs/KWh		1.84	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	1.76	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23	2.23
Total COG	Rs/KWh		5.71	6.69	6.57	6.45	6.33	6.21	6.10	5.99	5.88	5.77	5.66	5.55	5.45	5.35	5.25	5.15	3.78	3.84	3.91	3.98	4.06	4.61	4.69	4.77	4.86	4.95	5.04	5.14	5.24	5.34	5.45	5.56	5.67	5.79	5.92	6.05	6.18	6.32	6.47	6.62	6.77		

Levelised Tariff-FY 2020-21	5.71	Rs/KWh
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Assumption for Biomass Based Rankine Cycle Project Parameters				State	Andhra Pradesh
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Parameter
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Aux Consumption	%	10.00%
			Plant Load Factor	%	80.00%
			Useful Life	Years	25
2	Project Cost	Capital Cost	Normative Capital Cost	Rs. Lakh/MW	559.00
			Capital Cost	Rs. Lakh	559.00
			Capital Subsidy	Rs. Lakh	0
			Net Capital Cost	Rs. Lakh	559.00
3	Financial Assumption	Debt Equity	Tariff Period	Years	25
			Debt	%	70%
			Equity	%	30%
		Debt Component	Total Debt Amount	Rs. Lakh	391.30
			Total Equity Amount	Rs. Lakh	167.70
			Loan Amount	Rs. Lakh	391.30
			Moratorium Period	Years	0
			Repayment Period (including Moratorium)	Years	15
		Equity Component	Interest Rate	%	9.67%
			Equity Amount	Rs. Lakh	167.70
			Return on Equity for First 20 years	% p.a	16.96%
			Return on Equity after 20 years	% p.a	21.52%
		Tax Rate	Discount Rate	%	8.61%
			Corporate Tax Rate	%	34.94%
		Depreciation	MAT Rate	%	17.47%
			Depreciation Rate for 1st 15 years	%	4.67%
	Depreciation Rate 16th years onwards	%	2.00%		
	4	O&M Expenses	Normative O&M expense	Rs. Lakh/MW	46.42
O&M expenses p.a			Rs. Lakh	46.42	
Escalation factor			%	3.84%	
5	Working Capital	O&M expenses p.a	Month	1	
		Maintenance Spares	% of O&M expenses	15.00%	
		Receivables	Days	1.5	
		Interest on Working Capital	% per annum	11.17%	
6	Fuel Related Assumptions	Biomass	Heat Rate	Kcal/kWh	4200.00
			Fuel Price	Rs./MT	3326.00
			GCV Biomass	kcal/kg	3100.00
			Biomass price escalation factor	%	5.00%
7	Generation and Sale of Power	Number of Hours		Hours	8766.00

CERC RE Tariff Order FY 2020-21

Determination of Tariff Components		Biomass (Rankine Cycle) Based Power Project																										
Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Net Generation	MU		6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Variable Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Biomass Cost	Rs. Lakh		316.01	331.81	348.40	365.82	384.11	403.32	423.48	444.66	466.89	490.24	514.75	540.48	567.51	595.88	625.68	656.96	689.81	724.30	760.52	798.54	838.47	880.39	924.41	970.63	1019.16	
Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
O&M Expenses	Rs Lakh		46.42	48.20	50.05	51.97	53.97	56.04	58.19	60.42	62.74	65.14	67.64	70.24	72.93	75.73	78.64	81.66	84.79	88.04	91.42	94.93	98.57	102.35	106.28	110.36	114.59	
Depreciation	Rs Lakh		26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09
Interest on term loan	Rs Lakh		36.59	34.07	31.55	29.02	26.50	23.98	21.45	18.93	16.40	13.88	11.36	8.83	6.31	3.79	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		19.59	20.45	21.35	22.30	23.29	24.34	25.44	26.59	27.80	29.08	30.42	31.82	33.30	34.85	36.48	38.00	39.84	41.76	43.78	45.89	48.22	50.56	53.00	55.57	58.26	
Return on Equity	Rs Lakh		28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45
Total Fixed Cost	Rs Lakh		157.14	157.26	157.48	157.83	158.29	158.88	159.61	160.47	161.48	162.64	163.95	165.43	167.08	168.91	170.92	159.29	164.25	169.43	174.83	180.45	194.06	200.18	206.55	213.20	220.12	

Levelised tariff corresponding to Useful life																												
Per Unit Cost of Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Per unit Variable Cost	Rs/kWh		7.80	5.01	5.26	5.52	5.80	6.09	6.39	6.71	7.05	7.40	7.77	8.16	8.56	8.99	9.44	9.91	10.41	10.93	11.48	12.05	12.65	13.28	13.95	14.65	15.38	16.15
O&M expn	Rs/kWh		1.03	0.74	0.76	0.79	0.82	0.86	0.89	0.92	0.96	0.99	1.03	1.07	1.11	1.16	1.20	1.25	1.29	1.34	1.39	1.45	1.50	1.56	1.62	1.68	1.75	1.82
Depreciation	Rs/kWh		0.37	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Int. on term loan	Rs/kWh		0.29	0.58	0.54	0.50	0.46	0.42	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.10	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh		0.46	0.31	0.32	0.34	0.35	0.37	0.39	0.40	0.42	0.44	0.46	0.48	0.50	0.53	0.55	0.58	0.60	0.63	0.66	0.69	0.73	0.76	0.80	0.84	0.88	0.92
RoE	Rs/kWh		0.46	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
Total COG	Rs/kWh		10.41	7.50	7.75	8.02	8.30	8.59	8.91	9.24	9.59	9.96	10.34	10.75	11.18	11.64	12.12	12.62	12.93	13.53	14.16	14.82	15.51	16.36	17.12	17.92	18.76	19.64

Variable Cost for FY 2020-21	5.01	Rs/kWh
Levelised Tariff (Fixed)	2.61	Rs/kWh
Levelised Tariff -FY 2020-21	7.62	Rs/kWh

Determination of AD for Biomass based Power Project	
Depreciation amount	90.00%
Book Depreciation rate	5.28%
Tax Depreciation rate	40.00%
Additional Depreciation	20.00%
Income Tax (MAT)	17.47%
Income Tax (Normal Rates)	34.94%
Capital Cost (Rs./Lakh)	559.00

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	14.76	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	16.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Opening	%	100%	70%	35%	21%	13%	8%	5%	3%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	30%	35%	14%	8%	5%	3%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Closing	%	70%	35%	21%	13%	8%	5%	3%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Accelerated Depreciation	Rs Lakh	167.70	195.65	78.26	48.96	28.17	16.90	10.14	6.09	3.65	2.19	1.31	0.79	0.47	0.28	0.17	0.10	0.06	0.04	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	152.94	166.13	48.74	17.44	-1.34	-12.61	-19.37	-23.43	-25.86	-27.32	-28.20	-28.73	-29.04	-29.23	-29.34	-29.41	-29.45	-16.06	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	53.44	58.05	17.03	6.09	-0.47	-4.41	-6.77	-8.19	-9.04	-9.55	-9.85	-10.04	-10.15	-10.21	-10.25	-10.28	-10.29	-5.61	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	3.16	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	1.69	0.92	0.27	0.10	-0.01	-0.07	-0.11	-0.13	-0.14	-0.15	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.92	0.85	0.78	0.72	0.66	0.61	0.56	0.52	0.48	0.44	0.40	0.37	0.34	0.31	0.29	0.27	0.25	0.23	0.21	0.19	0.18	0.16	0.15	0.14	0.14
Applicable Discounting Factor		1.00	0.96	0.88	0.81	0.75	0.69	0.64	0.58	0.54	0.50	0.46	0.42	0.39	0.36	0.33	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.17	0.16	0.14	0.14

Tax Benefit Levelised	7.00	Rs/kWh
Electricity Generation (Levelised)	6.04	Rs/kWh
Levelised benefit	0.12	Rs/kWh

Annexure 2.1B					
Assumption for Biomass Based Rankine Cycle Project Parameters				State	Haryana
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Parameter
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Aux Consumption	%	10.00%
			Plant Load Factor	%	80.00%
			Useful Life	Years	25
2	Project Cost	Capital Cost	Normative Capital Cost	Rs. Lakh/MW	559.00
			Capital Cost	Rs. Lakh	559.00
			Capital Subsidy	Rs. Lakh	0
			Net Capital Cost	Rs. Lakh	559.00
3	Financial Assumption	Debt Equity	Tariff Period	Years	25
			Debt	%	70%
			Equity	%	30%
		Debt Component	Total Debt Amount	Rs. Lakh	391.30
			Total Equity Amount	Rs. Lakh	167.70
			Loan Amount	Rs. Lakh	391.30
			Moratorium Period	Years	0
			Repayment Period (including Moratorium)	Years	15
		Equity Component	Interest Rate	%	9.67%
			Equity Amount	Rs. Lakh	167.70
			Return on Equity for First 20 years	% p.a	16.96%
			Return on Equity after 20 years	% p.a	21.52%
		Tax Rate	Discount Rate	%	8.61%
			Corporate Tax Rate	%	34.94%
		Depreciation	MAT Rate	%	17.47%
			Depreciation Rate for 1st 15 years	%	4.67%
4	O&M Expenses		Depreciation Rate 16th years onwards	%	2.00%
			Normative O&M expense	Rs. Lakh/MW	46.42
			O&M expenses p.a	Rs. Lakh	46.42
5	Working Capital		Escalation factor	%	3.84%
			O&M expenses p.a	Month	1
			Maintenance Spares	% of O&M expenses	15.00%
			Receivables	Days	1.5
6	Fuel Related Assumptions	Biomass	Interest on Working Capital	% per annum	11.17%
			Heat Rate	Kcal/kWh	4200.00
			Fuel Price	Rs./MT	3786.00
			GCV Biomass	kcal/kg	3100.00
7	Generation and Sale of Power	Number of Hours	Biomass price escalation factor	%	5.00%
				Hours	8766.00

CERC RE Tariff Order FY 2020-21

Determination of Tariff Components		Biomass (Rankine Cycle) Based Power Project																									
Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Net Generation	MU		6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Variable Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Biomass Cost	Rs. Lakh		359.72	377.70	396.59	416.42	437.24	459.10	482.05	506.16	531.46	558.04	585.94	615.24	646.00	678.30	712.21	747.82	785.21	824.48	865.70	908.98	954.43	1002.16	1052.26	1104.88	1160.12
Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		46.42	48.20	50.05	51.97	53.97	56.04	58.19	60.42	62.74	65.14	67.64	70.24	72.93	75.73	78.64	81.66	84.79	88.04	91.42	94.93	98.57	102.35	106.28	110.36	114.59
Depreciation	Rs Lakh		26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09
Interest on term loan	Rs Lakh		36.59	34.07	31.55	29.02	26.50	23.98	21.45	18.93	16.40	13.88	11.36	8.83	6.31	3.79	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		21.86	22.83	23.85	24.92	26.05	27.23	28.48	29.79	31.16	32.60	34.12	35.71	37.38	39.13	40.98	42.72	44.79	46.96	49.24	51.63	54.25	56.88	59.64	62.54	65.58
Return on Equity	Rs Lakh		28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45
Total Fixed Cost	Rs Lakh		159.41	159.64	159.98	160.45	161.05	161.78	162.65	163.67	164.83	166.16	167.65	169.31	171.16	173.19	175.41	164.01	169.21	174.63	180.29	186.19	200.09	206.50	213.19	220.17	227.44

Levilled tariff corresponding to Useful life																												
Per Unit Cost of Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Per unit Variable Cost	Rs/kWh		8.88	5.70	5.98	6.28	6.60	6.93	7.27	7.64	8.02	8.42	8.84	9.28	9.75	10.24	10.75	11.28	11.85	12.44	13.06	13.72	14.40	15.12	15.88	16.67	17.51	18.38
O&M expn	Rs/kWh		1.03	0.74	0.76	0.79	0.82	0.86	0.89	0.92	0.96	0.99	1.03	1.07	1.11	1.16	1.20	1.25	1.29	1.34	1.39	1.45	1.50	1.56	1.62	1.68	1.75	1.82
Depreciation	Rs/kWh		0.37	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	
Int. on term loan	Rs/kWh		0.29	0.58	0.54	0.50	0.46	0.42	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.10	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Int. on working capital	Rs/kWh		0.52	0.35	0.36	0.36	0.39	0.41	0.43	0.45	0.47	0.49	0.52	0.54	0.57	0.59	0.62	0.65	0.68	0.71	0.74	0.78	0.82	0.86	0.90	0.94	0.99	1.04
RoE	Rs/kWh		0.46	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	
Total COG	Rs/kWh		11.55	8.23	8.51	8.82	9.14	9.48	9.84	10.21	10.61	11.03	11.47	11.94	12.43	12.95	13.49	14.06	14.45	15.12	15.83	16.57	17.35	18.29	19.15	20.05	20.99	21.98

Variable Cost for FY 2020-21	5.70	Rs/kWh
Levilled Tariff (Fixed)	2.67	Rs/kWh
Levilled Tariff -FY 2020-21	8.37	Rs/kWh

Determination of AD for Biomass based Power Project	
Depreciation amount	90.00%
Book Depreciation rate	5.28%
Tax Depreciation rate	40.00%
Additional Depreciation	20.00%
Income Tax (MAT)	17.47%
Income Tax (Normal Rates)	34.94%
Capital Cost (Rs./Lakh)	559.00

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	14.76	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	16.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Opening	%	100%	70%	35%	21%	13%	8%	5%	3%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	30%	35%	14%	8%	5%	3%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Closing	%	70%	35%	21%	13%	8%	5%	3%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Accelerated Depreciation	Rs Lakh	167.70	195.65	78.26	48.96	28.17	16.90	10.14	6.09	3.65	2.19	1.31	0.79	0.47	0.28	0.17	0.10	0.06	0.04	0.02	0.01	0.01	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	152.94	166.13	48.74	17.44	-1.34	-12.61	-19.37	-23.43	-25.86	-27.32	-28.20	-28.73	-29.04	-29.23	-29.34	-29.41	-29.45	-16.06	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	53.44	58.05	17.03	6.09	-0.47	-4.41	-6.77	-8.19	-9.04	-9.55	-9.85	-10.04	-10.15	-10.21	-10.25	-10.28	-10.29	-5.61	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	3.16	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	1.69	0.92	0.27	0.10	-0.01	-0.07	-0.11	-0.13	-0.14	-0.15	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.92	0.85	0.78	0.72	0.66	0.61	0.56	0.52	0.48	0.44	0.40	0.37	0.34	0.31	0.29	0.27	0.25	0.23	0.21	0.19	0.18	0.16	0.15	0.14
Applicable Discounting Factor		1.00	0.96	0.88	0.81	0.75	0.69	0.64	0.58	0.54	0.50	0.46	0.42	0.39	0.36	0.33	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.17	0.16	0.14

Tax Benefit Levilled	7.00	Rs/kWh
Electricity Generation (Levilled)	6.04	Rs/kWh
Levilled benefit	0.12	Rs/kWh

Assumption for Biomass Based Rankine Cycle Project Parameters				State	Annexure 2.1C Maharashtra
S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Parameter
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	1
			Aux Consumption	%	10.00%
			Plant Load Factor	%	80.00%
			Useful Life	Years	25
2	Project Cost	Capital Cost	Normative Capital Cost	Rs. Lakh/MW	559.00
			Capital Cost	Rs. Lakh	559.00
			Capital Subsidy	Rs. Lakh	0
			Net Capital Cost	Rs. Lakh	559.00
3	Financial Assumption	Debt Equity	Tariff Period	Years	25
			Debt	%	70%
			Equity	%	30%
		Debt Component	Total Debt Amount	Rs. Lakh	391.30
			Total Equity Amount	Rs. Lakh	167.70
			Loan Amount	Rs. Lakh	391.30
			Moratorium Period	Years	0
			Repayment Period (including Moratorium)	Years	15
		Equity Component	Interest Rate	%	9.67%
			Equity Amount	Rs. Lakh	167.70
			Return on Equity for First 20 years	% p.a	16.96%
			Return on Equity after 20 years	% p.a	21.52%
		Tax Rate	Discount Rate	%	8.61%
			Corporate Tax Rate	%	34.94%
Depreciation	MAT Rate	%	17.47%		
	Depreciation Rate for 1st 15 years	%	4.67%		
	Depreciation Rate 16th years onwards	%	2.00%		
	4	O&M Expenses	Normative O&M expense	Rs. Lakh/MW	46.42
O&M expenses p.a			Rs. Lakh	46.42	
Escalation factor			%	3.84%	
5	Working Capital	O&M expenses p.a	Month	1	
		Maintenance Spares	% of O&M expenses	15.00%	
		Receivables	Days	1.5	
		Interest on Working Capital	% per annum	11.17%	
6	Fuel Related Assumptions	Biomass	Heat Rate	Kcal/kWh	4200.00
			Fuel Price	Rs./MT	3872.00
			GCV Biomass	kcal/kg	3100.00
			Biomass price escalation factor	%	5.00%
7	Generation and Sale of Power	Number of Hours		Hours	8766.00

CERC RE Tariff Order FY 2020-21

Determination of Tariff Components		Biomass (Rankine Cycle) Based Power Project																									
Units Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Installed Capacity	MW		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Net Generation	MU		6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	

Variable Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Biomass Cost	Rs. Lakh		367.89	386.28	405.60	425.88	447.17	469.53	493.00	517.65	543.54	570.71	599.25	629.21	660.67	693.71	728.39	764.81	803.05	843.20	885.36	929.63	976.11	1024.92	1076.17	1129.97	1186.47

Fixed Cost	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh		46.42	48.20	50.05	51.97	53.97	56.04	58.19	60.42	62.74	65.14	67.64	70.24	72.93	75.73	78.64	81.66	84.79	88.04	91.42	94.93	98.57	102.35	106.28	110.36	114.59
Depreciation	Rs Lakh		26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09	26.09
Interest on term loan	Rs Lakh		36.59	34.07	31.55	29.02	26.50	23.98	21.45	18.93	16.40	13.88	11.36	8.83	6.31	3.79	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs Lakh		22.28	23.28	24.32	25.42	26.57	27.78	29.05	30.38	31.79	33.26	34.81	36.43	38.14	39.93	41.82	43.80	45.72	47.93	50.26	52.70	55.37	58.06	60.88	63.84	66.95
Return on Equity	Rs Lakh		28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45	28.45
Total Fixed Cost	Rs Lakh		159.83	160.08	160.45	160.94	161.57	162.32	163.22	164.26	165.46	166.82	168.34	170.04	171.92	173.99	176.25	164.89	170.13	175.61	181.31	187.26	201.21	207.68	214.43	221.47	228.81

Levilled tariff corresponding to Useful life																												
Per Unit Cost of Generation	Unit	Year→	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Per unit Variable Cost	Rs/kWh		9.08	5.83	6.12	6.43	6.75	7.08	7.44	7.81	8.20	8.61	9.04	9.49	9.97	10.47	10.99	11.54	12.12	12.72	13.36	14.03	14.73	15.47	16.24	17.05	17.90	18.80
O&M expn	Rs/kWh		1.03	0.74	0.76	0.79	0.82	0.86	0.89	0.92	0.96	0.99	1.03	1.07	1.11	1.16	1.20	1.25	1.29	1.34	1.39	1.45	1.50	1.56	1.62	1.68	1.75	1.82
Depreciation	Rs/kWh		0.37	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	
Int. on term loan	Rs/kWh		0.29	0.58	0.54	0.50	0.46	0.42	0.38	0.34	0.30	0.26	0.22	0.18	0.14	0.10	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Int. on working capital	Rs/kWh		0.53	0.35	0.37	0.39	0.40	0.42	0.44	0.46	0.48	0.50	0.53	0.55	0.58	0.60	0.63	0.66	0.69	0.72	0.76	0.80	0.84	0.88	0.92	0.96	1.01	1.06
RoE	Rs/kWh		0.46	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.57	0.57	0.57	0.57	
Total COG	Rs/kWh		11.76	8.36	8.66	8.97	9.30	9.64	10.01	10.40	10.80	11.23	11.69	12.16	12.66	13.19	13.75	14.33	14.73	15.42	16.14	16.90	17.70	18.65	19.53	20.45	21.41	22.42

Variable Cost for FY 2020-21	5.83	Rs/kWh
Levilled Tariff (Fixed)	2.68	Rs/kWh
Levilled Tariff -FY 2020-21	8.51	Rs/kWh

Determination of AD for Biomass based Power Project	
Depreciation amount	90.00%
Book Depreciation rate	5.28%
Tax Depreciation rate	40.00%
Additional Depreciation	20.00%
Income Tax (MAT)	17.47%
Income Tax (Normal Rates)	34.94%
Capital Cost (Rs./Lakh)	559.00

Years	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Book Depreciation	%	2.64%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	5.28%	2.88%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Book Depreciation	Rs Lakh	14.76	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	29.52	16.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Accelerated Depreciation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Opening	%	100%	70%	35%	21%	13%	8%	5%	3%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Allowed during the year	%	30%	35%	14%	8%	5%	3%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Closing	%	70%	35%	21%	13%	8%	5%	3%	2%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Accelerated Depreciation	Rs Lakh	167.70	195.65	78.26	48.96	28.17	16.90	10.14	6.09	3.65	2.19	1.31	0.79	0.47	0.28	0.17	0.10	0.06	0.04	0.02	0.01	0.01	0.00	0.00	0.00	0.00

Net Depreciation Benefit	Rs Lakh	152.94	166.13	48.74	17.44	-1.34	-12.61	-19.37	-23.43	-25.86	-27.32	-28.20	-28.73	-29.04	-29.23	-29.34	-29.41	-29.45	-16.06	0.02	0.01	0.01	0.00	0.00	0.00	0.00
Tax Benefit	Rs Lakh	53.44	58.05	17.03	6.09	-0.47	-4.41	-6.77	-8.19	-9.04	-9.55	-9.85	-10.04	-10.15	-10.21	-10.25	-10.28	-10.29	-5.61	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Energy generation	MU	3.16	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31	6.31
Per unit benefit	Rs/Unit	1.69	0.92	0.27	0.10	-0.01	-0.07	-0.11	-0.13	-0.14	-0.15	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.16	-0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Discounting Factor		1.00	0.92	0.85	0.78	0.72	0.66	0.61	0.56	0.52	0.48	0.44	0.40	0.37	0.34	0.31	0.29	0.27	0.25	0.23	0.21	0.19	0.18	0.16	0.15	0.14
Applicable Discounting Factor		1.00	0.96	0.88	0.81	0.75	0.69	0.64	0.58	0.54	0.50	0.46	0.42	0.39	0.36	0.33	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.17	0.16	0.14

Tax Benefit Levilled	7.00	Rs/kWh
Electricity Generation (Levilled)	6.04	Rs/kWh
Levilled benefit	0.12	Rs/kWh