GENERIC TARIFF ORDER FOR RENEWABLE ENERGY SOURCES FOR FY 2020-2021

Coram

Shri M.K Goel, Chairperson

Suo-moto Petition No.: JERC/ LEGAL/MISC. P/12/2020

Order
Dated: 26th May, 2020

JOINT ELECTRICITY REGULATORY COMMISSION
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Abbreviations

Acronyms	Expanded Form
CUF	Capacity Utilisation Factor
COD	Commercial Operation Date
CPI	Consumer Price Index
FY	Financial Year
GW	Gigawatt
IT Act	Income Tax Act
kWh	kilowatt hour
MW	Megawatt
MAT	Minimum Alternative Tax
MNRE	Ministry of New & Renewable Energy
O&M	Operation and Maintenance
PV	Photo Voltaic
PLF	Plant Load Factor
RE	Renewable Energy
RoE	Return on Equity
SHP	Small Hydro Plant
WPI	Wholesale Price Index

Before the

Joint Electricity Regulatory Commission

For the State of Goa and Union Territories, Gurugram

QUORUM

Sh. M. K. Goel, Chairperson

Suo-Moto Petition No.: JERC/ LEGAL/MISC. P/12/2020

In the matter of

Generic tariff order for renewable energy sources for the FY 2020-2021

ORDER

Dated:26th May, 2020

1) In compliance of the Renewable Energy Tariff Regulations, 2019, the Commission has determined the generic tariff for Solar PV, Wind and Small Hydro Projects for the State of Goa, Andaman & Nicobar Islands, Lakshadweep Islands, Puducherry, Daman & Diu, Dadra & Nagar Haveli and Chandigarh Union Territories as under:

Generic Tariff for Solar PV Projects

States/Union Territories	Tariff Period (Years)	Levellized Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levellized Tariff (upon adjusting for accelerated depreciation benefit, if availed)
Goa	25	4.82	0.36	4.46
Chandigarh	25	5.10	0.38	4.72
Dadra & Nagar Haveli	25	4.82	0.36	4.46
Daman	25	4.82	0.36	4.46
Diu	25	4.82	0.36	4.46
Puducherry	25	4.82	0.36	4.46
Andaman & Nicobar Island	25	6.94	0.51	6.43
Lakshadweep	25	6.94	0.51	6.43

Generic Tariff for Wind Energy Based Projects

States/Union Territories	Tariff Period (Years)	Levellized Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levellized Tariff (upon adjusting for accelerated depreciation benefit, if availed)
GOA	25	5.06	0.38	4.68
Chandigarh	25	5.06	0.38	4.68
Dadra & Nagar Haveli	25	5.06	0.38	4.68
Daman	25	4.79	0.36	4.44
Diu	25	3.50	0.26	3.24
Puducherry	25	4.34	0.32	4.02
Andaman & Nicobar Island	25	6.83	0.50	6.33
Lakshadweep	25	6.88	0.51	6.38

Generic Tariff for Small Hydro Projects (Mainland)

Type of SHP	Tariff Period (Years)	Levellized Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levellized Tariff (upon adjusting for accelerated depreciation benefit, if availed)
Lower than or equal to 5 MW	35	4.63	0.31	4.32
Above 5MW and lower than or equal to 25MW	35	4.21	0.28	3.92

Generic Tariff for Small Hydro Projects (Islands)

Type of SHP	Tariff Period (Years)	Levellized Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levellized Tariff (upon adjusting for accelerated depreciation benefit, if availed)
Lower than or equal to 5 MW	35	7.09	0.48	6.61
Above 5MW and lower than or equal to 25MW	35	6.08	0.41	5.67

2) This Order shall come into force with effect from 1st June, 2020 and shall, continue till 31st March, 2021 or till further orders of the Commission whichever is later. The existing Generic Tariff issued vide Order no. JERC/LEGAL/MISC. P/12/2019, dated 02nd September, 2019 is hereby extended till 31st May, 2020, due to unprecedented situation caused by COVID 19.

3) Ordered accordingly. The attached documents giving detailed reasons, grounds and conditions are integral part of this Order.

-Sd-

(M.K. Goel)

Chairperson

Place: Gurugram
Date:26 May, 2020

(Certified Copy)

(Rakesh Kumar)
Secretary

1 BACKGROUND

1.1.1 The Commission has notified the Joint Electricity Regulatory Commission (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2019 (Renewable Energy Tariff Regulations, 2019) for determination of Tariff of eligible RE Projects selling electricity to Distribution Licensees, on 24th July, 2019. The Regulations specify the terms and conditions and the procedure for determination of Generic Tariff in respect of the following types of Renewable Energy (RE) Generation Projects:

(a) Solar PV (for Gross Metering);

(b) Wind Energy based projects;

(c) Small hydro based projects:

1.1.2 Regulation 9.1 of the Renewable Energy Tariff Regulations, 2019 requires the Commission to determine the Generic Tariffs for RE Technologies for which the norms have been specified in the Regulations:

"9.1 The Commission shall determine the generic tariff at the beginning of each year of the Control Period for Renewable Energy technologies mentioned at Regulation 7 for projects to be commissioned in that year"

1.1.3 In discharge of its mandate under Regulation 9.1, the Commission determines the Generic Tariff for RE Technologies for FY 2020-21 to be applicable for the RE Projects, which would be commissioned during the year after the issuance of this order.

1.1.4 The Ministry of New & Renewable Energy (MNRE), Government of India has set an ambitious target of achieving 175 GW target for installed grid connected RE capacity by 2022. Guidelines have been issued for carrying out competitive bidding for various RE projects and Tariffs discovered by competitive bidding are considerably lower than the RE Generic Tariffs. Over the years, maturing RE Technologies achieving higher CUF at lower costs and innovative financial engineering in project costing have reduced the gap between Tariffs of conventional power projects and RE projects.

1.1.5 It has been observed that since the rates discovered by competitive bidding process are considerably lower than the Generic Tariffs determined in the earlier years, many of the Distribution Companies have been procuring RE power by way of competitive bidding rather than power purchase at RE Generic Tariff.

1.1.6 In this regard, second proviso to Regulation 10.1 of Renewable Energy Tariff Regulations, 2019 specifies as follows:

"Provided further that in case the Distribution Licensee opts to procure power from Renewable Energy Projects through competitive bidding process in accordance with the guidelines issued by the central government, the Generic Tariff determined by the Commission shall act as a ceiling tariff and for such procurement of power, the Distribution Licensee shall file the Petition for adoption of tariff under Section 63 of the Act;"

2 GENERAL PRINCIPLES

2.1 Tariff Structure

2.1.1 Regulation 11 of Renewable Energy Tariff Regulations, 2019 specifies that the tariff for Renewable Energy technologies shall be single-part tariff consisting of the following fixed cost components:

"*a) Operation and maintenance expenses;*
b) Interest on loan capital;
c) Depreciation;
d) Interest on working capital;
e) Return on equity:

Provided that for Renewable Energy technologies like biomass power projects having fuel cost component, single-part tariff with two components, fixed cost component and fuel cost component, shall be determined."

2.2 Tariff Design

2.2.1 As per Regulation 12 of Renewable Energy Tariff Regulations, 2019, the Tariff Design for RE Generating Stations is as under:

"*12.1The generic tariff shall be determined considering the year of commissioning of the project, on levelized basis for the Tariff Period*"

Provided that for Renewable Energy technologies having single-part tariff with two components, tariff shall be determined on levelized basis considering the year of commissioning of the project for fixed cost component while the fuel cost component shall be determined on the basis of year of operation.

12.2 For the purpose of levelized tariff computation, the discount factor equivalent to Post Tax weighted average cost of capital shall be considered.

12.3Levelization shall be carried out for the 'useful life' of the Renewable Energy project."

2.2.2 Accordingly, the Commission has computed the Generic Tariff in this Order for Projects to be commissioned after the date of issuance of this order in FY 2020-21, which will be applicable for the entire useful life of the Project.

3 FINANCIAL PRINCIPLES (RENEWABLE ENERGY TARIFF REGULATIONS, 2019)

3.1 Debt Equity Ratio

3.1.1 As per Regulation 14 of Renewable Energy Tariff Regulations, 2019, the Debt Equity ratio shall be as under, for tariff determination

"14.1 Debt Equity ratio of 70:30 shall be considered"

3.2 Loan and Finance Charges

3.2.1 Regulation 15.1 of Renewable Energy Tariff Regulations, 2019 specifies loan tenure of 12 years for determination of the Generic Tariff for RE Projects. Regulation 15.2 provides for consideration of the rate of interest on loan as follows:

- **Mainland**- SBI MCLR (One-year tenor) prevailing during the last available six months + 200 basis points, which works out to 7.91%+2%= 9.91%
- **Island-** SBI MCLR (One-year tenor) prevailing during the last available six months + 300 basis points, which works out to 7.91%+3%= 10.91%

3.3 Depreciation

3.3.1 Regarding Depreciation Regulation 16.3 specifies as follows:

"16.3 Depreciation rate of 5.83% per annum shall be considered for first 12 years and remaining depreciation shall be spread during remaining useful life of the RE projects considering the salvage value of the project as 10% of project cost. "

3.3.2 The Commission has computed the depreciation in accordance with the said provisions of Regulations.

3.4 Return on Equity

3.4.1 Regarding Return on Equity Regulation 17.2 specifies as follows:

"17.2 The normative Return on Equity shall be: a) 14% for Renewable Energy Projects in Mainland areas; b) 16% for Renewable Energy Projects in Island areas; to be grossed up by prevailing Minimum Alternate Tax (MAT) rate as on 1st April of available year at the time of determination of tariff for the entire useful life of the project."

The Effective MAT rate as on 1st April of 2020 is 17.47%, as shown in the Table below:

Table 1: MAT Rate

Particulars		Formulae	MAT
Base Tax Rate (A)			15.00%
Surcharge (B)	12%	(Ax12%)	1.80%
Tax Rate + surcharge (C)		(A+B)	16.80%
Health & Education Cess (D)	4%	(Cx4%)	0.67%
Effective Tax Rate €		(C+D)	17.47%

3.4.2 Accordingly, the Commission has computed the RoE in accordance with the provisions of Regulations by grossing up the normative rate of RoE with effective MAT rate of 17.47%.

3.5 Rate of Interest for Interest on Working Capital

3.5.1 Regarding Interest Rate for Interest on Working Capital, Regulation 18.3specifies as follows:

"18.3 Normative Rate of Interest on Working Capital shall be considered as follows:

Normative Working Capital Interest Rate

Particulars	***Interest Rates***
Mainland	*State Bank of India MCLR (One-Year Tenor) prevalent during the last available six months + 300 basis points*
Island	*State Bank of India MCLR (One-Year Tenor) prevalent during the last available six months + 400 basis points*

"

3.5.2 Accordingly, the Commission has considered the normative rate of Interest on Working Capital considering the MCLR as 7.91%, as follows:

- Mainland Areas- 7.91%+3%= 10.91%
- Island Areas- 7.91%+4%= 11.91%

3.6 Levelized Tariff

3.6.1 In accordance with the provisions of Renewable Energy Tariff Regulations, 2019, the Levelized Tariff is computed by undertaking levelization over the Useful Life of each RE technology considering a discount factor equivalent to the normative post-tax weighted average cost of capital, to represent the time value of money.

3.7 Discount Factor

3.7.1 The discount factor considered is 9.12% for Mainland Areas and 10.21% for island Areas, which is equal to the normative post-tax weighted average cost of capital on the basis of the normative debt-equity ratio of 70:30 specified in the Regulations, and the weighted average rates for the debt and equity components.

3.7.2 The Interest Rates considered for the loan component (i.e., 70%) of Capital Cost for mainland areas and Island Areas are 9.91% and 10.21%, respectively. For the equity component (i.e., 30%), the rate of RoE is considered is 14% for mainland areas and 16% for Island Areas.

3.8 Escalation Rate for O&M Expenses

3.8.1 Regulation 20.3 of Renewable Energy Tariff Regulations, 2019 specifies about Escalation Rate for O&M Expense as follows:

"20.3 Normative O&M expenses allowed during first year of the Control Period (i.e. FY 2019-20) under these Regulations shall be escalated at average inflation factor of previous three years considering 60% weightage for the actual point to point inflation over Wholesale Price Index numbers as per Office of Economic Advisor, Ministry of Commerce and Industry, Government of India and 40% weightage for the actual Consumer Price Index for Industrial Workers (all India) as per Labour Bureau, Government of India in the previous three years."

3.8.2 Accordingly, the escalation rate has been computed considering the WPI and CPI inflation for FY 2017-18, FY 2018-19 and FY 2019-20 in the ratio of 60:40, which works out to 3.93%.

3.9 Accelerated Depreciation

3.9.1 Regulation 24.1 of Renewable Energy Tariff Regulations, 2019 specifies as follows:
"The Commission shall take into consideration any incentive or subsidy offered by the Central or State Government, including accelerated depreciation benefit if availed by the generating company, for the renewable energy power plants while determining the tariff under these Regulations:

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

- *Assessment of benefit shall be based on normative Capital Cost, accelerated depreciation rate as per relevant provisions under Income Tax Act and corporate*

Income Tax rate;

- *Capitalization of RE project during second half of the fiscal year;*
- *Per unit benefit shall be derived on levelized basis at discount factor equivalent to weighted average cost of capital."*

3.9.2 Accordingly, for Projects availing the benefit of accelerated depreciation, the applicable Corporate Income Tax rate of 29.12% (25% Income Tax rate + 12% surcharge + 4% Health & Education Cess) has been considered. As per the Circular dated 7 November, 2016 of the Income Tax Department, the accelerated depreciation rates have been revised to 40% from FY 2017-18. Moreover, additional 20% depreciation in the initial year is proposed to be extended to new assets acquired by Generation Companies vide the amendment to Section 32 (1) (ii a) of the Income Tax Act.

3.9.3 For determining the net depreciation benefits, depreciation @ 5.28% as per the Straight Line Method (book depreciation as per the Companies Act, 2013) has been compared with depreciation as per the Income Tax Act, i.e., 40% under the Written Down Value method. The tax benefit has been worked out as per the Corporate Income Tax rate on the net depreciation benefit. The 'per unit levelized accelerated depreciation benefit has been computed considering the weighted average cost of capital as per the discounting, as detailed in para. 4.7.1 of this Order.

3.10 Applicability of Tariff Order

3.10.1 This Order shall come into force with effect from 1st June, 2020 and shall, continue to be in force till further orders of the Commission. As the tariff is being implemented with effect from 1st June, 2020 instead of 1st April, 2020, Order issued in FY 2019-20 is valid till 31st May, 2020. The tariff determined under this Order shall be applicable for Renewable Energy Projects commissioned after the issuance of this Order in FY 2020-21 for the entire useful life of the Project.

3.10.2 The following Sections of this Order outline the technology-wise norms and corresponding Generic Tariffs for RE Projects to be commissioned in FY 2020-21 based on following RE Technologies:

- Solar PV
- Wind Energy
- Small Hydro

4 GENERIC TARIFF FOR SOLAR PV POWER PROJECTS (FOR GROSS METERING)

4.1.1 The Generic Tariff for Solar PV Power Projects (for Gross Metering) has been computed for FY 2020-21 based on General and Financial principles as discussed above and Technology Specific parameters for Solar PV Power Projects.

4.2 Useful Life

4.2.1 The Useful Life specified for Solar Photo Voltaic Based Projects under Regulation 2.4 (44) of the RE Tariff Regulations, 2019 is 25 Years from COD.

4.3 Tariff Period

4.3.1 As per Regulation 6.1, the Tariff Period for Solar PV power project is same as Useful Life of the project, i.e., 25 Years from COD.

4.4 Capital Cost

4.4.1 The Commission has considered the normative Capital Cost for Solar PV Power Projects (for Gross Metering) as specified in Regulation 35.1 of Renewable Energy Tariff Regulations, 2019, as follows: -

"35.1 The normative Capital Cost for Solar PV projects shall be as follows:

a) Solar PV Projects in Mainland Areas: Rs. 5.00 Cr/MW (without capital Subsidy);

b) Solar PV Projects in Island Areas: Rs. 6.00 Cr/MW (without capital Subsidy)."

4.5 Debt: Equity Ratio

Mainland Areas

4.5.1 In accordance with Regulation 14.1 of Renewable Energy Tariff Regulations, 2019, the debt and equity components for Solar PV Power Projects (for Gross Metering) work out to Rs. 350 lakh per MW and Rs. 150 lakh per MW (i.e., 70% and 30% of the Capital Cost), respectively.

Island Areas

4.5.2 In accordance with Regulation 14.1 of Renewable Energy Tariff Regulations, 2019, the debt and equity components for Solar PV Power Projects (for Gross Metering) for Island Area work out to Rs. 420 lakh per MW and Rs. 180 lakh per MW (i.e., 70% and 30% of the Capital Cost), respectively.

4.6 Return on Equity

4.6.1 In accordance with Regulation 17.2 of Renewable Energy Tariff Regulations, 2019, the RoE works out as shown in the Table below:

Table 2 Return on Equity for Solar PV (Mainland Areas)

Particulars	Solar PV Power Projects (for Gross Metering) of 1MW
Opening Equity (in Rs lakh per MW)	150.00
Return on Equity @14% grossing up with MAT rate of 17.47% (Rs lakh per MW)	25.45

Table 3 Return on Equity for Solar PV (Island Areas)

Particulars	Solar PV Power Projects (for Gross Metering) of 1MW
Opening Equity (in Rs lakh per MW)	180.00
Return on Equity @16% grossing up with MAT rate of 17.47% (Rs lakh per MW)	34.90

4.7 Interest on loan

Mainland Areas

4.7.1 The interest rate of 9.91% has been taken for Solar PV Power Projects in Mainland Areas (for Gross Metering), with a gross opening loan amount of Rs. 350 lakh per MW for Projects.

Island Areas

4.7.2 The interest rate of 10.91% has been taken for Solar PV Power Projects in Island Areas (for Gross Metering), with a gross opening loan amount of Rs. 420 lakh per MW.

4.8 Depreciation

4.8.1 In accordance with Regulation 16.3 of Renewable Energy Tariff Regulations, 2019, the depreciation for Solar PV Power Projects (for Gross Metering) has been worked out at rate of 5.83% for the first 12 years and at rate of 1.54% thereafter for the remaining Useful Life of 13 years.

4.9 Operation and Maintenance Expenses

4.9.1 As regards Operation and Maintenance Expenses, Regulation 37.1 of Renewable Energy Tariff Regulations, 2019 specifies as follows:

"The normative O&M expenses for the first year of the Control Period,

a) 1.5% of Capital Cost for first year, for Solar PV Projects in Mainland Areas;

b) 2.0% of Capital Cost for first year, for Solar PV Projects in Island Areas."

4.9.2 The Commission has accordingly worked out the O&M Expenses for FY 2020-21 as follows:

Table 4 O&M Expenses for Mainland Areas (Rs. Lakh/MW)

Solar PV	O&M Expenses for FY 2020-21
Solar PV Projects	7.50

Table 5 O&M Expenses for Island Areas (Rs. Lakh/MW)

Solar PV	O&M Expenses for FY 2020-21
Solar PV Projects	12.00

4.9.3 As discussed earlier, the escalation rate for projecting O&M expenses for subsequent years work out to 3.93% and the same has been considered for projecting the O&M Expenses for subsequent years till the useful life of the Project.

4.10 Interest on Working Capital

4.10.1 The year-wise Working Capital Requirement has been computed in accordance with Regulation 18.1 of Renewable Energy Tariff Regulations, 2019, which specifies as follows:

"The Working Capital requirement in respect of Wind energy projects, Small Hydro Power, Solar PV and Solar thermal power projects shall be computed in accordance with the following:

a) Operation & Maintenance expenses for one month;

b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilisation Factor (CUF / PLF) as applicable;

c) Maintenance spares @ 15% of Operation and Maintenance expenses."

4.10.2 As discussed earlier, as per Regulation 18.3, the Commission has considered the normative interest rate on working capital as 10.91% for Mainland Areas and 11.91% for Island Areas for working out the year-wise Interest on Working Capital.

4.11 Capacity Utilization Factor

4.11.1 In accordance with Regulation 36, CUF considered for determination of Tariff for Solar PV Power Projects is as follows:

Table 6 CUF for Solar PV

State / Union Territory	CUF %
Puducherry	18%
Dadra & Nagar Haveli	18%
Lakshadweep	17%
Andaman & Nicobar Islands	17%
Daman	18%
Diu	18%
Chandigarh	17%
Goa	18%

4.12 Auxiliary Power Consumption

4.12.1 Regarding Auxiliary Power Consumption Regulation 38 specifies as follows:

"38.1 The auxiliary consumption factor shall be 0.25% of the gross generation:

Provided that the Commission may deviate from the above norm in case of project specific tariff determination in accordance with Regulation 9."

4.13 Generic Tariff for Solar PV Power Projects (for Gross Metering)

4.13.1 Considering the above parameters and the discount factor of 9.12% for Mainland Areas and 10.21% for Island Areas for levelization of Tariff, Tariffs during the applicable period of this Order for Solar PV Power Projects (Gross Metering) commissioned between the date of issuance of this Order to 31 March 2021, have been determined as under:

Table 7 Generic Tariff for Solar PV Power Projects (Rs./kWh)

States/Union Territories	Tariff Period (Years)	Levelized Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levelized Tariff (upon adjusting for accelerated depreciation benefit, if availed)
Goa	25	4.82	0.36	4.46
Chandigarh	25	5.10	0.38	4.72
Dadra & Nagar Haveli	25	4.82	0.36	4.46
Daman	25	4.82	0.36	4.46
Puducherry	25	4.82	0.36	4.46
Diu	25	4.82	0.36	4.46
Andaman & Nicobar Island	25	6.94	0.51	6.43
Lakshadweep	25	6.94	0.51	6.43

5 GENERIC TARIFF FOR WIND ENERGY BASED PROJECTS

5.1.1 The Generic Tariff for Wind Energy Based Projects has been computed for FY 2020-21 based on General and Financial principles as discussed above and Technology Specific parameters for Wind Energy Based Projects.

5.2 Useful Life

5.2.1 The Useful Life specified for Wind Energy Based Projects under Regulation 2.4 (44 a) of the RE Tariff Regulations is 25 Years from COD.

5.3 Tariff Period

5.3.1 As per Regulation 6.1 the Tariff Period is equal to the Useful Life of the project, i.e., 25 Years from COD.

5.4 Capital Cost

5.4.1 The Commission has considered the normative Capital Cost for Wind Energy Based Projects as specified in Regulation 26.2 of Renewable Energy Tariff Regulations, 2019, as follows:

"26.2 The Capital Cost for Wind Energy Projects shall be as follows:
a) Mainland area: Rs. 5.25 Crore/MW;

b) Island areas (Andaman & Nicobar): Rs. 6.25 Crore/MW;

c) Island areas (Lakshadweep): Rs. 7.00 Crore/MW;"

5.5 Debt: Equity Ratio

Mainland Areas

5.5.1 In accordance with Regulation 14.1 of Renewable Energy Tariff Regulations, 2019 the debt and equity components for Wind Energy Based Projects work out to Rs. 367.50 lakh per MW and Rs. 157.50 lakh per MW (i.e., 70% and 30% of the Capital Cost), respectively.

Island Areas (Andaman & Nicobar)

5.5.2 In accordance with Regulation 14.1 of Renewable Energy Tariff Regulations, 2019, the debt and equity components for Wind Energy Based Projects work out to Rs. 437.50 lakh per MW and Rs. 187.50 lakh per MW (i.e., 70% and 30% of the Capital Cost), respectively.

Island Areas (Lakshadweep)

5.5.3 In accordance with Regulation 14.1 of Renewable Energy Tariff Regulations, 2019, the debt and equity components for Wind Energy projects work out to Rs. 490 lakh per MW and Rs. 210 lakh per MW (i.e., 70% and 30% of the Capital Cost), respectively.

5.6 Return on Equity

5.6.1 In accordance with Regulation 17.2 of Renewable Energy Tariff Regulations, 2019, the RoE works out as shown in the Table below:

Table 8 RoE for Mainland Areas

Particulars	Wind Energy
Opening Equity (in Rs lakh per MW)	157.50
Return on Equity @14% after grossing up with MAT rate of 17.47% (Rs lakh per MW)	26.72

Table 9 RoE for Island Areas (Andaman & Nicobar)

Particulars	Wind Energy
Opening Equity (in Rs lakh per MW)	187.50
Return on Equity @16% after grossing up with MAT rate of 17.47% (Rs lakh per MW)	36.35

Table 10 RoE for Island Areas (Lakshadweep)

Particulars	Wind Energy
Opening Equity (in Rs lakh per MW)	210.00
Return on Equity @16% after grossing up with MAT rate of 17.47% (Rs lakh per MW)	40.71

5.7 Interest on loan

Mainland Areas

5.7.1 The interest rate of 9.91% has been taken for Wind Energy Power Projects in Mainland Areas, with a gross opening loan amount of Rs. 367.50 lakh per MW.

Island Areas (Andaman & Nicobar)

5.7.2 The interest rate of 10.91% has been taken for Wind Energy Power Projects, with a gross opening loan amount of Rs. 437.50 lakh per MW for Projects in Island Areas (Andaman & Nicobar).

Island Areas (Lakshadweep)

5.7.3 The interest rate of 10.91% has been taken for Wind Energy Power Projects, with a gross opening loan amount of Rs. 490.00 lakh per MW for Projects in Island Areas (Lakshadweep).

5.8 Depreciation

5.8.1 In accordance with Regulation 16.3 of Renewable Energy Tariff Regulations,2019, the depreciation for Wind Energy Based Projects has been worked out at rate of 5.83% for the first 12 years and at rate of 1.54% thereafter for the remaining Useful Life of 13 years.

5.9 Operation and Maintenance Expenses

5.9.1 As regards Operation and Maintenance Expenses, Regulation 28.1 of Renewable Energy Tariff Regulations, 2019 specifies as follows:

"The normative O&M expenses for the first year of the Control Period,

a) 1.5% of Capital Cost for Wind Energy Projects in Mainland Areas;

b) 2.0% of Capital Cost for Wind Energy Projects in Island Areas."

5.9.2 The Commission has accordingly worked out the O&M Expenses for FY 2020-21 as follows:

Table 11 O&M Expenses for Mainland Areas (Rs. Lakh/MW)

Particulars	O&M Expenses for FY 2020-21
Wind Energy Projects	7.88

Table 12 O&M Expenses for Island Areas Andaman & Nicobar (Rs. Lakh/MW)

Particulars	O&M Expenses for FY 2020-21
Wind Energy Projects	12.50

Table 13 O&M Expenses for Island Areas Lakshadweep (Rs. Lakh/MW)

Particulars	O&M Expenses for FY 2020-21
Wind Energy Projects	14.00

5.9.3 As discussed earlier, the escalation rate for projecting O&M expenses for subsequent years works out to 3.93%, and the same has been considered for projecting the O&M Expenses for subsequent years till the Useful Life of the Project.

5.10 Interest on Working Capital

5.10.1 The year-wise Working Capital Requirement has been computed in accordance with Regulation 18.1 of Renewable Energy Tariff Regulations, 2019, which specifies as follows:

"The Working Capital requirement in respect of Wind energy projects, Small Hydro Power, Solar PV and Solar thermal power projects shall be computed in accordance with the following:

a) Operation & Maintenance expenses for one month;
b) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilisation Factor (CUF / PLF) as applicable;
c) Maintenance spares @ 15% of Operation and Maintenance expenses."

5.10.2 As discussed earlier, as Per Regulation 18.3, the Commission has considered the normative interest rate on working capital as 10.91% for Mainland Areas and 11.91% for Island Areas for working out the year-wise Interest on Working Capital.

5.11 Capacity Utilization Factor

5.11.1 In accordance with Regulation 27, CUF considered for determination of Tariff for Wind Energy Projects is as follows:

Table 14 CUF for Wind Energy Projects

State / Union Territory	CUF %
Goa	18%
Andaman & Nicobar Islands	18%
Puducherry	21%
Lakshadweep	20%
Daman	19%
Chandigarh	18%
Dadra & Nagar Haveli	18%
Diu	26%

5.12 Auxiliary Power Consumption

5.12.1 In accordance with Regulation 29 of Renewable Energy Tariff Regulations, 2019, Normative Auxiliary Consumption of 0.25% of the gross generation has been considered for determination of Tariff.

5.13 Generic Tariff for Wind Energy Based Projects

5.13.1 Considering the above parameters and the discount factor of 9.12% for Mainland Areas and 10.21% for Island areas for levelization of Tariff, tariffs during the applicable period of this Order for Wind Energy Power Projects commissioned between the date of issuance of this Order to 31 March 2021 have been determined as under:

Table 15 Generic Tariff for Wind Energy Power Projects (Rs./kWh)

States/Union Territories	Tariff Period (Years)	Levelized Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levelized Tariff (upon adjusting for accelerated depreciation benefit, if availed)
GOA	25	5.06	0.38	4.68
Chandigarh	25	5.06	0.38	4.68
Dadra & Nagar Haveli	25	5.06	0.38	4.68
Daman	25	4.79	0.36	4.44
Puducherry	25	4.34	0.32	4.02

States/Union Territories	Tariff Period (Years)	Levelized Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levelized Tariff (upon adjusting for accelerated depreciation benefit, if availed)
Diu	25	3.50	0.26	3.24
Andaman & Nicobar Island	25	6.83	0.50	6.33
Lakshadweep	25	6.88	0.51	6.38

6 SMALL (INCLUDING MINI/MICRO) HYDRO POWER PROJECTS

6.1.1 The Generic Tariff for Small Hydro Projects has been computed for FY 2020-21 based on General and Financial principles as discussed above and Technology Specific parameters for Small Hydro Projects.

6.2 Useful Life

6.2.1 The Useful Life specified for Small Hydro Projects, under Regulation 2.4 (44) of the RE Tariff Regulations, 2019, is 35 years from COD.

6.3 Tariff Period

6.3.1 As per Regulation 6.1, the Tariff Period is equal to Useful Life of the project, i.e., 35 years from COD.

6.4 Capital Cost of Small Hydro Projects

6.4.1 The Commission has considered the normative Capital Cost for Small Hydro Projects as specified in Regulation 30.1 of Renewable Energy Tariff Regulations, 2019, as follows:

"Projects in Mainland Areas:

a. Below or equal to 5 MW: *Rs. 7.79 Cr/MW,*

b. Above 5 MW and below or equal to 25 MW: *Rs. 7.07 Cr/MW*

Projects in Island Areas:

a. Below or equal to 5 MW: *Rs. 10.50 Cr/MW,*

b. Above 5 MW and below or equal to 25 MW: *Rs. 9.00Cr/MW"*

6.5 DEBT-EQUITY RATIO

Mainland Areas

6.5.1 In accordance with Regulation 14.1 of Renewable Energy Tariff Regulations, 2019, the debt and equity components for SHPs with capacities below or equal to 5 MW work out to Rs. 545.30 lakh per MW and Rs233.70 lakh per MW (i.e., 70% and 30% of the Capital Cost), respectively. For Projects of capacities above 5 MW and lower than or equal to 25 MW, the debt and equity components work out to Rs. 494.90 lakh per MW and Rs. 212.10 lakh per MW, respectively.

Island Areas

6.5.2 In accordance with Regulation 14.1 of Renewable Energy Tariff Regulations, 2019, the debt and equity components for SHPs with capacities below or equal to 5 MW work out to Rs. 735.00 lakh per MW and Rs. 315.00 lakh per MW (i.e., 70% and 30% of the Capital Cost), respectively. For Projects of capacities above 5 MW and lower than or equal to 25 MW, the debt and equity components work out to Rs. 630.00 lakh per MW and Rs. 270.00 lakh per MW, respectively.

6.6 Return on Equity

6.6.1 In accordance with Regulation 17.2 of Renewable Energy Tariff Regulations, 2019, the RoE works out as shown in the Table below:

Table 16 RoE for Mainland Areas

Particulars	below or equal to 5 MW	> 5 MW and lower than or equal to 25 MW
Opening Equity (in Rs lakh per MW)	233.70	212.10
Return on Equity @14% grossing up with MAT rate of 17.47% (Rs lakh per MW)	39.64	35.98

Table 17 RoE for Island Areas

Particulars	below or equal to 5 MW	> 5 MW and lower than or equal to 25 MW
Opening Equity (in Rs lakh per MW)	315.00	270.00
Return on Equity @16% grossing up with MAT rate of 17.47% (Rs lakh per MW)	61.07	52.35

6.7 INTEREST ON LOAN

Mainland Areas

6.7.1 The interest rate of 9.91% has been taken for SHPs with capacities lower than or equal to 5 MW, with a gross opening loan amount of Rs. 545.30 lakh per MW; and for SHPs above 5 MW and lower than or equal to 25 MW, with a gross opening loan amount of Rs. 494.90 lakh per MW for Projects in Mainland Areas.

Island Areas

6.7.2 The interest rate of 10.91% has been taken for SHPs with capacities lower than or equal to 5 MW, with a gross opening loan amount of Rs. 735.00 lakh per MW; and for SHPs above 5 MW and lower than or equal to 25 MW, with a gross opening loan amount of Rs. 630.00 lakh per MW for Projects in Island Areas.

6.8 Depreciation

6.8.1 In accordance with Regulation 16.3 of Renewable Energy Tariff Regulations, 2019, the depreciation for Small Hydro Projects has been worked out at rate of 5.83% for the first 12 years and at rate of 0.87% thereafter for the remaining Useful Life of 23 years.

6.9 Operation and Maintenance Expenses

6.9.1 As regards Operation and Maintenance Expenses, Regulation 33.1 of Renewable Energy Tariff Regulations, 2019 specifies as follows:

"The normative O&M expenses for the first year of the Control Period,

a) 2% of Capital Cost for Small hydro Projects, in Mainland Areas;

b) 2.5% of Capital Cost for Projects in Island Areas."

6.9.2 The Commission has accordingly worked out the O&M Expenses for FY 2020-21 as follows:

Table 18 O&M Expenses for Mainland Areas

Project Size	O&M Expense Norm	O&M Expenses (Rs. lakh/MW)
Lower than or equal to 5 MW	2% of the Capital Cost	15.58
5MW lower than or equal to 25MW	2% of the Capital Cost	14.14

Table 19 O&M Expenses for Island Areas

Project Size	O&M Expense Norm	O&M Expenses (Rs. lakh/MW)
Lower than or equal to 5 MW	2.5% of the Capital Cost	26.25
5MW lower than or equal to 25MW	2.5% of the Capital Cost	22.50

6.9.3 As discussed earlier, the escalation rate for projecting O&M expenses for subsequent years works out to 3.93%, and the same has been considered for projecting the O&M Expenses for subsequent years till the useful life of the Project.

6.10 Interest on Working Capital

6.10.1 The year-wise Working Capital Requirement has been computed in accordance with Regulation 18.1 of Renewable Energy Tariff Regulations, 2019, which specifies as follows:

"The Working Capital requirement in respect of Wind energy projects, Small Hydro Power, Solar PV and Solar thermal power projects shall be computed in accordance with the following:

d) Operation & Maintenance expenses for one month;
e) Receivables equivalent to 2 (Two) months of energy charges for sale of electricity calculated on the normative Capacity Utilisation Factor (CUF / PLF) as applicable;
f) Maintenance spares @ 15% of Operation and Maintenance expenses."

6.10.2 As discussed earlier, as Per Regulation 18.3, the Commission has considered the normative interest rate on working capital as 10.91% for mainland Areas and 11.91% for Island Areas for working out the year-wise Interest on Working Capital.

6.11 Capacity Utilization Factor

6.11.1 In Accordance with Regulation 31, a CUF of 30% has been considered for determination of Tariff for Small Hydro Based Projects.

6.12 Auxiliary Power Consumption

6.12.1 In accordance with Regulation 32of Renewable Energy Tariff Regulations, 2019, normative Auxiliary Consumption of 1.0% of the gross generation has been considered for determination of Tariff.

6.13 Generic Tariff for Small Hydro Projects

6.13.1 Considering the above parameters and the discount factor of 9.12% for Mainland Areas and 10.21% for Island Areas for levelization of Tariff, Tariffs during the applicable period of this Order for Small Hydro Projects (Mainland Areas & Island Areas) commissioned between the date of issuance of this Order to 31 March 2020 have been determined as under:

Table 20 Generic Tariff for Mainland Area (Rs./kWh)

Type of SHP	Tariff Period (Years)	Levelized Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levelized Tariff (upon adjusting for accelerated depreciation benefit,if availed)
Lower than or equal to 5 MW	35	4.63	0.31	4.32
Above 5MW and lower than or equal to 25MW	35	4.21	0.28	3.92

Table 21 Generic Tariff for Island Areas (Rs./kWh)

Type of SHP	Tariff Period (Years)	Levelized Tariff	Benefit of Accelerated Depreciation (if availed)	Net Levelized Tariff (upon adjusting for accelerated depreciation benefit, if availed)
Lower than or equal to 5 MW	35	7.09	0.48	6.61
Above 5MW and lower than or equal to 25MW	35	6.08	0.41	5.67

7 DETAILS OF ANNEXURE

7.1.1 The detailed computation of the Generic Tariff for various Renewable Energy Technologies are set out in the following Annexures to this Order

Table 22 List of Annexures

S. No.	RE Projects	Remark
1	Solar PV (for Gross Metering)	Annexure -1
2	Wind Energy Power Project	Annexure-2
3	Small Hydro Project- Mainland	Annexure-3
4	Small Hydro Project- Island Areas	Annexure-3A

Annexure-1

Solar PV (For Gross Metering) – Assumptions and Parameters for Tariff Determination

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Mainland	Island
1	**Power Generation**	Capacity				
			Installed Power Generation Capacity	MW	1	1
			Capacity Utilization Factor	%		
			Auxiliary Consumption	%	0.25%	0.25%
			Useful Life	Years	25	25
2	**Project Cost**	Capital Cost/MW -	Power Plant Cost	Rs Lakh/MW	500.00	600.00
3	**Sources of Fund**		Tariff Period	Years	25	25
		Debt: Equity				
			Debt	%	70%	70%
			Equity	%	30%	30%
			Total Debt Amount	Rs Lakh	350.00	420.00
			Total Equity Amount	Rs Lakh	150.00	180.00
		Debt Component				
			Repayment Period	years	12	12
			Interest Rate	%	9.91%	10.91%
		Equity Component				
			Equity amount	Rs Lacs	150.00	180.00
			Return on Equity	% p.a	16.96%	19.39%
			Discount Rate		9.12%	10.21%
4	**Financial Assumptions**	Fiscal Assumptions				
			Income Tax	%	29.12%	29.12%
			MAT Rate	%	17.47%	17.47%
		Depreciation				
			Depreciation Rate for first 12 years	%	5.83%	5.83%
			Depreciation Rate 11th year onwards	%	1.54%	1.54%
			Years for 5.83% rate		12	12
5	**Working Capital**	For Fixed Charges				
		O&M Charges		Months	1	1
		Maintenance Spare	(% of O&M expenses)		15.00%	15.00%
		Receivables for Debtors		Months	2	2
		Interest On Working Capital		%	10.91%	11.91%
6	**Operation & Maintenance**					
		O&M Cost power plant		Rs Lakh	7.50	12.00
		Total O & M Expenses			1.50%	2.00%
		Escalation		%	3.93%	3.93%

Solar PV Projects: Determination of Tariff Component GOA, Dadar & Nagar Haveli, Daman, Puducherry and DIU

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	7.50	7.79	8.10	8.42	8.75	9.09	9.45	9.82	10.21	10.61	11.02	11.46	11.91	12.37	12.86	13.36	13.89	14.43	15.00	15.59	16.20	16.84	17.50	18.19	18.90
Depreciation	Rs Lakh	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71
Interest on term loan	Rs Lakh	33.24	30.35	27.46	24.57	21.68	18.79	15.91	13.02	10.13	7.24	4.35	1.46	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	1.96	1.92	1.88	1.84	1.80	1.76	1.73	1.69	1.65	1.62	1.58	1.55	1.14	1.16	1.19	1.21	1.23	1.26	1.28	1.31	1.33	1.36	1.39	1.42	1.45
Return on Equity	Rs Lakh	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45
Total Fixed Cost	**Rs Lakh**	**97.29**	**94.66**	**92.03**	**89.43**	**86.83**	**84.25**	**81.68**	**79.12**	**76.58**	**74.06**	**71.55**	**69.06**	**46.20**	**46.69**	**47.20**	**47.73**	**48.27**	**48.84**	**49.44**	**50.05**	**50.69**	**51.35**	**52.04**	**52.76**	**53.51**

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
Electricity Generation	**MU**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**

Total COG	RS./kwh	6.19	6.02	5.85	5.69	5.52	5.36	5.19	5.03	4.87	4.71	4.55	4.39	2.94	2.97	3.00	3.03	3.07	3.11	3.14	3.18	3.22	3.27	3.31	3.35	3.40
Discount Factor		1.00	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12

Levelised Tariff Without Accumlated Depreciation	RS./Unit	4.82
Levelised Depreciation Benefit	RS./Unit	0.36
Levelised Tariff With Accumlated Depreciation	RS./Unit	4.46

Solar PV: Determination of Tariff component for Chandigarh

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	7.50	7.79	8.10	8.42	8.75	9.09	9.45	9.82	10.21	10.61	11.02	11.46	11.91	12.37	12.86	13.36	13.89	14.43	15.00	15.59	16.20	16.84	17.50	18.19	18.90
Depreciation	Rs Lakh	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	29.15	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71	7.71
Interest on term loan	Rs Lakh	33.24	30.35	27.46	24.57	21.68	18.79	15.91	13.02	10.13	7.24	4.35	1.46	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	1.96	1.92	1.88	1.84	1.80	1.76	1.73	1.69	1.65	1.62	1.58	1.55	1.14	1.16	1.19	1.21	1.23	1.26	1.28	1.31	1.33	1.36	1.39	1.42	1.45
Return on Equity	Rs Lakh	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45	25.45
Total Fixed Cost	**Rs Lakh**	**97.29**	**94.66**	**92.03**	**89.43**	**86.83**	**84.25**	**81.68**	**79.12**	**76.58**	**74.06**	**71.55**	**69.06**	**46.20**	**46.69**	**47.20**	**47.73**	**48.27**	**48.84**	**49.44**	**50.05**	**50.69**	**51.35**	**52.04**	**52.76**	**53.51**

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
Electricity Generation	**MU**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**

Total COG	RS./kwh	6.55	6.37	6.20	6.02	5.85	5.67	5.50	5.33	5.16	4.99	4.82	4.65	3.11	3.14	3.18	3.21	3.25	3.29	3.33	3.37	3.41	3.46	3.50	3.55	3.60
Discount Factor		1.00	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12
Levelised Tariff Without Accumlated Depreciation	RS./Unit	5.10																								
Levelised Depreciation Benefit	RS./Unit	0.38																								
Levelised Tariff With Accumlated Depreciation	RS./Unit	4.72																								

Solar PV: Determination of Tariff, component for Andaman & Nicobar Island/Lakshadweep

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	12.00	12.47	12.96	13.47	14.00	14.55	15.12	15.71	16.33	16.97	17.64	18.33	19.05	19.80	20.57	21.38	22.22	23.09	24.00	24.94	25.92	26.94	28.00	29.10	30.24
Depreciation	Rs Lakh	34.98	34.98	34.98	34.98	34.98	34.98	34.98	34.98	34.98	34.98	34.98	34.98	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25	9.25
Interest on term loan	Rs Lakh	43.91	40.09	36.28	32.46	28.64	24.83	21.01	17.20	13.38	9.57	5.75	1.93	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	2.89	2.83	2.78	2.73	2.68	2.62	2.58	2.53	2.48	2.43	2.39	2.34	1.82	1.86	1.89	1.93	1.97	2.02	2.06	2.11	2.15	2.20	2.25	2.31	2.36
Return on Equity	Rs Lakh	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90	34.90
Total Fixed Cost	**Rs Lakh**	**128.67**	**125.27**	**121.89**	**118.53**	**115.20**	**111.88**	**108.58**	**105.31**	**102.07**	**98.85**	**95.65**	**92.49**	**65.02**	**65.80**	**66.62**	**67.46**	**68.34**	**69.26**	**70.21**	**71.20**	**72.22**	**73.29**	**74.40**	**75.55**	**76.75**

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
Electricity Generation	**MU**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**	**1.49**

Total COG	RS./kwh	8.66	8.43	8.21	7.98	7.75	7.53	7.31	7.09	6.87	6.65	6.44	6.23	4.38	4.43	4.48	4.54	4.60	4.66	4.73	4.79	4.86	4.93	5.01	5.09	5.17
Discount Factor		1.00	0.91	0.82	0.75	0.68	0.61	0.56	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.26	0.23	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.11	0.10

Levelised Tariff Without Accumlated Depreciation	RS./Unit	6.94
Levelised Depreciation Benefit	RS./Unit	0.51
Levelised Tariff With Accumlated Depreciation	RS./Unit	6.43

Annexure-2

Wind Energy Based Projects- Assumptions and Parameters for Tariff Determination

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	Mainland	Island Andaman & Nicobar	Island Lakshadweep
1	**Power Generation**	Capacity					
			Installed Power Generation Capacity	MW	1	1	1
			Capacity Utilization Factor	%			
			Auxiliary Consumption	%	0.25%	0.25%	0.25%
			Useful Life	Years	25	25	25
2	**Project Cost**	Capital Cost/MW	Power Plant Cost	Rs Lakh/MW	525.00	625.00	700.00
3	**Sources of Fund**		Tariff Period	Years	25	25	
		Debt: Equity					
			Debt	%	70%	70%	70%
			Equity	%	30%	30%	30%
			Total Debt Amount	Rs Lakh	367.50	437.50	490.00
			Total Equity Amout	Rs Lakh	157.50	187.50	210.00
		Debt Component					
			Repayment Period	years	12	12	12
			Interest Rate	%	9.91%	10.91%	10.91%
		Equity Component					
			Equity amount	Rs Lacs	157.50	187.50	210.00
			Return on Equity	% p.a	16.96%	19.39%	19.39%
			Discount Rate		9.12%	10.21%	10.21%
4	**Financial Assumptions**	Fiscal Assumptions					
			Income Tax	%	29.12%	29.12%	29.12%
			MAT Rate	%	17.47%	17.47%	17.47%
		Depreciation					
			Depreciation Rate for first 12 years	%	5.83%	5.83%	5.83%
			Depreciation Rate 11th year onwards	%	1.54%	1.54%	1.54%
5	**Working Capital**	For Fixed Charges					
		O&M Charges		Months	1	1	1
		Maintenance Spare	(% of O&M exepenses)		15.00%	15.00%	15.00%
		Receivables for Debtors		Months	2	2	2
		Interest On Working Capital		%	10.91%	11.91%	11.91%
6	**Operation & Maintenance**						
		O&M Cost			1.50%	2.00%	2.00%
		power plant		Rs Lakh	7.88	12.50	14.00
		Total O & M Expenses Escalation		%	3.93%	3.93%	3.93%

Wind energy Based Projects: Determination of Tariff, component for GOA/Chandigarh/DNH

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	7.88	8.18	8.51	8.84	9.19	9.55	9.92	10.31	10.72	11.14	11.57	12.03	12.50	12.99	13.50	14.03	14.58	15.16	15.75	16.37	17.01	17.68	18.37	19.10	19.85
Depreciation	Rs Lakh	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09
Interest on term loan	Rs Lakh	34.90	31.86	28.83	25.80	22.77	19.73	16.70	13.67	10.64	7.60	4.57	1.54	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	2.06	2.02	1.97	1.93	1.89	1.85	1.81	1.77	1.73	1.70	1.66	1.62	1.20	1.22	1.24	1.27	1.29	1.32	1.34	1.37	1.40	1.43	1.46	1.49	1.53
Return on Equity	Rs Lakh	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72
Total Fixed Cost	**Rs Lakh**	**102.16**	**99.39**	**96.64**	**93.90**	**91.17**	**88.46**	**85.76**	**83.08**	**80.41**	**77.76**	**75.13**	**72.52**	**48.51**	**49.03**	**49.56**	**50.11**	**50.69**	**51.29**	**51.91**	**52.55**	**53.22**	**53.92**	**54.65**	**55.40**	**56.18**

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
Electricity Generation	**MU**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**

Total COG	RS./kwh	6.49	6.32	6.14	5.97	5.80	5.62	5.45	5.28	5.11	4.94	4.78	4.61	3.08	3.12	3.15	3.19	3.22	3.26	3.30	3.34	3.38	3.43	3.47	3.52	3.57
Discount Factor		1.00	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12
Levelised Tariff Without Accumlated Depreciation	RS./Unit	5.06																								
Levelised Depreciation Benefit	RS./Unit	0.38																								
Levelised Tariff With Accumlated Depreciation	RS./Unit	4.68																								

Wind energy Based Projects: Determination of Tariff, component for Daman

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	7.88	8.18	8.51	8.84	9.19	9.55	9.92	10.31	10.72	11.14	11.57	12.03	12.50	12.99	13.50	14.03	14.58	15.16	15.75	16.37	17.01	17.68	18.37	19.10	19.85
Depreciation	Rs Lakh	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09
Interest on term loan	Rs Lakh	34.90	31.86	28.83	25.80	22.77	19.73	16.70	13.67	10.64	7.60	4.57	1.54	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	2.06	2.02	1.97	1.93	1.89	1.85	1.81	1.77	1.73	1.70	1.66	1.62	1.20	1.22	1.24	1.27	1.29	1.32	1.34	1.37	1.40	1.43	1.46	1.49	1.53
Return on Equity	Rs Lakh	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72
Total Fixed Cost	**Rs Lakh**	**102.16**	**99.39**	**96.64**	**93.90**	**91.17**	**88.46**	**85.76**	**83.08**	**80.41**	**77.76**	**75.13**	**72.52**	**48.51**	**49.03**	**49.56**	**50.11**	**50.69**	**51.29**	**51.91**	**52.55**	**53.22**	**53.92**	**54.65**	**55.40**	**56.18**

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
Electricity Generation	**MU**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**	**1.66**

Total COG	RS./kwh	6.15	5.99	5.82	5.66	5.49	5.33	5.17	5.00	4.84	4.68	4.53	4.37	2.92	2.95	2.99	3.02	3.05	3.09	3.13	3.17	3.21	3.25	3.29	3.34	3.38
Discount Factor		1.00	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12
Levelised Tariff Without Accumlated Depreciation	RS./Unit	4.79																								
Levelised Depreciation Benefit	RS./Unit	0.36																								
Levelised Tariff With Accumlated Depreciation	RS./Unit	4.44																								

Wind energy Based Projects: Determination of Tariff, component for Puducherry

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	7.88	8.18	8.51	8.84	9.19	9.55	9.92	10.31	10.72	11.14	11.57	12.03	12.50	12.99	13.50	14.03	14.58	15.16	15.75	16.37	17.01	17.68	18.37	19.10	19.85
Depreciation	Rs Lakh	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09
Interest on term loan	Rs Lakh	34.90	31.86	28.83	25.80	22.77	19.73	16.70	13.67	10.64	7.60	4.57	1.54	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	2.06	2.02	1.97	1.93	1.89	1.85	1.81	1.77	1.73	1.70	1.66	1.62	1.20	1.22	1.24	1.27	1.29	1.32	1.34	1.37	1.40	1.43	1.46	1.49	1.53
Return on Equity	Rs Lakh	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72
Total Fixed Cost	**Rs Lakh**	**102.16**	**99.39**	**96.64**	**93.90**	**91.17**	**88.46**	**85.76**	**83.08**	**80.41**	**77.76**	**75.13**	**72.52**	**48.51**	**49.03**	**49.56**	**50.11**	**50.69**	**51.29**	**51.91**	**52.55**	**53.22**	**53.92**	**54.65**	**55.40**	**56.18**

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
Electricity Generation	**MU**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**	**1.84**

Total COG	RS./kwh	5.57	5.42	5.27	5.12	4.97	4.82	4.67	4.53	4.38	4.24	4.09	3.95	2.64	2.67	2.70	2.73	2.76	2.79	2.83	2.86	2.90	2.94	2.98	3.02	3.06
Discount Factor		1.00	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12
Levelised Tariff Without Accumlated Depreciation	RS./Unit	4.34																								
Levelised Depreciation Benefit	RS./Unit	0.32																								
Levelised Tariff With Accumlated Depreciation	RS./Unit	4.02																								

Wind energy Based Projects: Determination of Tariff, component for DIU

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	7.88	8.18	8.51	8.84	9.19	9.55	9.92	10.31	10.72	11.14	11.57	12.03	12.50	12.99	13.50	14.03	14.58	15.16	15.75	16.37	17.01	17.68	18.37	19.10	19.85
Depreciation	Rs Lakh	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	30.61	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09	8.09
Interest on term loan	Rs Lakh	34.90	31.86	28.83	25.80	22.77	19.73	16.70	13.67	10.64	7.60	4.57	1.54	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	2.06	2.02	1.97	1.93	1.89	1.85	1.81	1.77	1.73	1.70	1.66	1.62	1.20	1.22	1.24	1.27	1.29	1.32	1.34	1.37	1.40	1.43	1.46	1.49	1.53
Return on Equity	Rs Lakh	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72	26.72
Total Fixed Cost	**Rs Lakh**	**102.16**	**99.39**	**96.64**	**93.90**	**91.17**	**88.46**	**85.76**	**83.08**	**80.41**	**77.76**	**75.13**	**72.52**	**48.51**	**49.03**	**49.56**	**50.11**	**50.69**	**51.29**	**51.91**	**52.55**	**53.22**	**53.92**	**54.65**	**55.40**	**56.18**

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
Electricity Generation	**MU**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**	**2.27**

Total COG	RS./kwh	4.50	4.37	4.25	4.13	4.01	3.89	3.77	3.66	3.54	3.42	3.31	3.19	2.14	2.16	2.18	2.21	2.23	2.26	2.28	2.31	2.34	2.37	2.41	2.44	2.47
Discount Factor		1.00	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12
Levelised Tariff Without Accumlated Depreciation	RS./Unit	3.50																								
Levelised Depreciation Benefit	RS./Unit	0.26																								
Levelised Tariff With Accumlated Depreciation	RS./Unit	3.24																								

Wind energy Based Projects: Determination of Tariff, component for Andaman & Nicobar Island

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	12.50	12.99	13.50	14.03	14.58	15.15	15.75	16.37	17.01	17.68	18.37	19.09	19.84	20.62	21.43	22.27	23.15	24.06	25.00	25.98	27.00	28.06	29.17	30.31	31.50
Depreciation	Rs Lakh	36.44	36.44	36.44	36.44	36.44	36.44	36.44	36.44	36.44	36.44	36.44	36.44	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63	9.63
Interest on term loan	Rs Lakh	45.74	41.76	37.79	33.81	29.84	25.86	21.89	17.91	13.94	9.96	5.99	2.01	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	3.01	2.95	2.90	2.84	2.79	2.73	2.68	2.63	2.58	2.53	2.49	2.44	1.90	1.93	1.97	2.01	2.06	2.10	2.15	2.19	2.24	2.30	2.35	2.40	2.46
Return on Equity	Rs Lakh	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35	36.35
Total Fixed Cost	**Rs Lakh**	**134.03**	**130.49**	**126.97**	**123.47**	**120.00**	**116.54**	**113.11**	**109.70**	**106.32**	**102.97**	**99.64**	**96.34**	**67.72**	**68.54**	**69.39**	**70.27**	**71.19**	**72.14**	**73.13**	**74.16**	**75.23**	**76.34**	**77.50**	**78.70**	**79.95**

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
Electricity Generation	**MU**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**	**1.57**

Total COG	RS./kwh	8.52	8.30	8.07	7.85	7.63	7.41	7.19	6.97	6.76	6.55	6.33	6.13	4.31	4.36	4.41	4.47	4.53	4.59	4.65	4.72	4.78	4.85	4.93	5.00	5.08
Discount Factor		1.00	0.91	0.82	0.75	0.68	0.61	0.56	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.26	0.23	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.11	0.10
Levelised Tariff Without Accumlated Depreciation	RS./Unit	6.83																								
Levelised Depreciation Benefit	RS./Unit	0.50																								
Levelised Tariff With Accumlated Depreciation	RS./Unit	6.33																								

Wind energy Based Projects: Determination of Tariff, component for Lakshadweep

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
O&M Expenses	Rs Lakh	14.00	14.55	15.12	15.71	16.33	16.97	17.64	18.33	19.05	19.80	20.58	21.38	22.22	23.10	24.00	24.95	25.93	26.94	28.00	29.10	30.24	31.43	32.67	33.95	35.28
Depreciation	Rs Lakh	40.81	40.81	40.81	40.81	40.81	40.81	40.81	40.81	40.81	40.81	40.81	40.81	10.79	10.79	10.79	10.79	10.79	10.79	10.79	10.79	10.79	10.79	10.79	10.79	10.79
Interest on term loan	Rs Lakh	51.23	46.77	42.32	37.87	33.42	28.97	24.52	20.06	15.61	11.16	6.71	2.26	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	3.37	3.31	3.24	3.18	3.12	3.06	3.00	2.95	2.89	2.84	2.79	2.74	2.12	2.17	2.21	2.26	2.30	2.35	2.40	2.46	2.51	2.57	2.63	2.69	2.76
Return on Equity	Rs Lakh	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71	40.71
Total Fixed Cost	**Rs Lakh**	**150.12**	**146.15**	**142.21**	**138.29**	**134.39**	**130.53**	**126.68**	**122.87**	**119.08**	**115.32**	**111.60**	**107.90**	**75.85**	**76.77**	**77.72**	**78.71**	**79.73**	**80.80**	**81.91**	**83.06**	**84.26**	**85.51**	**86.80**	**88.14**	**89.54**

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
Electricity Generation	**MU**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**	**1.75**

Total COG	RS./kwh	8.59	8.36	8.14	7.91	7.69	7.47	7.25	7.03	6.81	6.60	6.39	6.17	4.34	4.39	4.45	4.50	4.56	4.62	4.69	4.75	4.82	4.89	4.97	5.04	5.12
Discount Factor		1.00	0.91	0.82	0.75	0.68	0.61	0.56	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.26	0.23	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.11	0.10
Levelised Tariff Without Accumlated Depreciation	RS./Unit	6.88																								
Levelised Depreciation Benefit	RS./Unit	0.51																								
Levelised Tariff With Accumlated Depreciation	RS./Unit	6.38																								

Annexure-3

Small Hydro Projects (Mainland) -Assumptions and Parameters for Tariff Determination

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	<= 5MW	>5 upto 25 MW
1	**Power Generation**					
		Capacity				
			Installed Power Generation Capacity	MW	1	1
			Capacity Utilization Factor	%	30%	30%
			Auxiliary Consumption	%	1.00%	1.00%
			Useful Life	Years	35	35
2	**Project Cost**					
		Capital Cost/MW	Power Plant Cost	Rs Lakh/MW	779.00	707.00
3	**Sources of Fund**					
			Tariff Period	Years	35	35
		Debt: Equity				
			Debt	%	70%	70%
			Equity	%	30%	30%
			Total Debt Amount	Rs Lakh	545.30	494.90
			Total Equity Amout	Rs Lakh	233.70	212.10
		Debt Component				
			Repayment Period	years	12	12
			Interest Rate	%	9.91%	9.91%
		Equity Component				
			Equity amount	Rs Lacs	233.70	212.10
			Return on Equity	% p.a	16.96%	16.96%
			Discount Rate		9.12%	9.12%
4	**Financial Assumptions**					
		Fiscal Assumptions				
			Income Tax	%	29.12%	29.12%
			MAT Rate	%	17.47%	17.47%
		Depreciation				
			Depreciation Rate for first 12 years	%	5.83%	5.83%
			Depreciation Rate 11th year onwards	%	0.87%	0.87%
5	**Working Capital**					
		For Fixed Charges				
		O&M Charges		Months	1	1
		Maintenance Spare	(% of O&M exepenses)		15.00%	15.00%
		Receivables for Debtors		Months	2	2
		Interest On Working Capital		%	10.91%	10.91%
6	**Operation & Maintenance**					
		O&M Cost			2.00%	2.00%
		power plant		Rs Lakh	15.58	14.14
		Total O & M Expenses Escalation		%	3.93%	3.93%

Small Hydro Project (Mainland): Determination of Tariff, component for Below or equal to 5 MW

Fixed Cost	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	25	25	25	25	25	25	25	25	25
O&M Expenses	Rs Lakh	15.58	16.19	16.83	17.49	18.17	18.89	19.63	20.40	21.20	22.03	22.90	23.80	24.73	25.70	26.71	27.76	28.85	29.98	31.16	32.39	33.66	34.98	36.35	37.78	39.26	40.80	42.41	44.07	45.80	47.60	49.47	51.41	53.43	55.53	57.71
Depreciation	Rs Lakh	45.42	45.42	45.42	45.42	45.42	45.42	45.42	45.42	45.42	45.42	45.42	45.42	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79
Interest on term loan	Rs Lakh	51.78	47.28	42.78	38.28	33.78	29.28	24.78	20.28	15.78	11.28	6.78	2.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	3.23	3.17	3.12	3.06	3.01	2.96	2.91	2.86	2.81	2.76	2.72	2.67	1.96	2.00	2.05	2.09	2.14	2.19	2.24	2.30	2.36	2.41	2.48	2.54	2.60	2.67	2.74	2.82	2.90	2.98	3.06	3.14	3.23	3.33	3.42
Return on Equity	Rs Lakh	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64	39.64
Total Fixed Cost	**Rs Lakh**	**155.65**	**151.70**	**147.78**	**143.89**	**140.02**	**136.19**	**132.38**	**128.60**	**124.85**	**121.14**	**117.46**	**113.81**	**73.12**	**74.14**	**75.19**	**76.29**	**77.43**	**78.61**	**79.84**	**81.12**	**82.44**	**83.82**	**85.26**	**86.75**	**88.30**	**89.91**	**91.58**	**93.32**	**95.13**	**97.01**	**98.96**	**100.99**	**103.10**	**105.29**	**107.56**

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	0	0	0	0	0	0	0	0	0	0
Electricity 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**

Total COG	RS./kwh	5.98	5.83	5.68	5.53	5.38	5.23	5.09	4.94	4.80	4.66	4.51	4.37	2.81	2.85	2.89	2.93	2.98	3.02	3.07	3.12	3.17	3.22	3.28	3.33	3.39	3.46	3.52	3.59	3.66	3.73	3.80	3.88	3.96	4.05	4.13
Discount Factor		1.00	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12	0.11	0.10	0.09	0.09	0.08	0.07	0.07	0.06	0.06	0.05

Levelised Tariff Without Accumlated	RS./Unit	4.63
Levelised Depreciation Benefit	RS./Unit	0.31
Levelised Tariff With Accumlated	RS./Unit	4.32

Small Hydro Project (Mainland): Determination of Tariff, component for Above 5 MW and below or equal to 25 MW

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M Expenses	Rs Lakh	14.14	14.70	15.27	15.87	16.49	17.14	17.82	18.52	19.24	20.00	20.78	21.60	22.45	23.33	24.24	25.20	26.19	27.21	28.28	29.39	30.55	31.75	32.99	34.29	35.63	37.03	38.49	40.00	41.57	43.20	44.90	46.66	48.49	50.39	52.37
Depreciation	Rs Lakh	41.22	41.22	41.22	41.22	41.22	41.22	41.22	41.22	41.22	41.22	41.22	41.22	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16
Interest on term loan	Rs Lakh	46.93	42.31	38.83	34.74	30.66	26.57	22.49	18.41	14.32	10.24	6.15	2.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	2.93	2.88	2.83	2.78	2.73	2.68	2.64	2.59	2.55	2.51	2.47	2.43	1.78	1.82	1.86	1.90	1.94	1.99	2.04	2.09	2.14	2.19	2.25	2.30	2.36	2.43	2.49	2.56	2.63	2.70	2.78	2.85	2.94	3.02	3.11
Return on Equity	Rs Lakh	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98	35.98
Total Fixed Cost	**Rs Lakh**	**141.26**	**137.68**	**134.12**	**130.59**	**127.08**	**123.60**	**120.14**	**116.71**	**113.31**	**109.94**	**106.60**	**103.30**	**66.37**	**67.29**	**68.24**	**69.24**	**70.27**	**71.34**	**72.46**	**73.62**	**74.82**	**76.08**	**77.38**	**78.73**	**80.14**	**81.60**	**83.12**	**84.70**	**86.34**	**88.04**	**89.81**	**91.65**	**93.57**	**95.56**	**97.62**

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	0	0	0	0	0	0	0	0	0	0
Electricity 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**

Total COG	RS./kwh	5.43	5.29	5.16	5.02	4.88	4.75	4.62	4.49	4.36	4.23	4.10	3.97	2.55	2.59	2.62	2.66	2.70	2.74	2.79	2.83	2.88	2.92	2.97	3.03	3.08	3.14	3.19	3.26	3.32	3.38	3.45	3.52	3.60	3.67	3.75
Discount Factor		1.00	0.92	0.84	0.77	0.71	0.65	0.59	0.54	0.50	0.46	0.42	0.38	0.35	0.32	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.16	0.15	0.13	0.12	0.11	0.10	0.09	0.09	0.08	0.07	0.07	0.06	0.06	0.05

Levelised Tariff Without Accumlated	RS./Unit	4.21
Levelised Depreciation Benefit	RS./Unit	0.28
Levelised Tariff With Accumlated	RS./Unit	3.92

Annexure-3A

Small Hydro Projects (Island) -Assumptions and Parameters for Tariff Determination

S. No.	Assumption Head	Sub-Head	Sub-Head (2)	Unit	<= 5MW	>5 upto 25 MW
1	**Power Generation**					
		Capacity				
			Installed Power Generation Capacity	MW	1	1
			Auxiliary Consumption	%	1%	1%
			Useful Life	Years	35	35
2	**Project Cost**					
		Capital Cost/MW	Power Plant Cost	Rs Lakh/MW	1050.00	900.00
3	**Sources of Fund**					
			Tariff Period	Years	35	35
		Debt: Equity				
			Debt	%	70%	70%
			Equity	%	30%	30%
			Total Debt Amount	Rs Lakh	735.00	630.00
			Total Equity Amout	Rs Lakh	315.00	270.00
		Debt Component				
			Repayment Period	years	12	12
			Interest Rate	%	10.91%	10.91%
		Equity Component				
			Equity amount	Rs Lacs	315.00	270.00
			Return on Equity	% p.a	19.39%	19.39%
			Discount Rate		10.21%	10.21%
4	**Financial Assumptions**					
		Fiscal Assumptions				
			Income Tax	%	29.12%	29.12%
			MAT Rate	%	17.47%	17.47%
		Depreciation				
			Depreciation Rate for first 12 years	%	5.83%	5.83%
			Depreciation Rate 11th year onwards	%	0.87%	0.87%
5	**Working Capital**					
		For Fixed Charges				
		O&M Charges		Months	1	1
		Maintenance Spare	(% of O&M exepenses)		15.00%	15.00%
		Receivables for Debtors		Months	2	2
		Interest On Working Capital		%	10.91%	10.91%
6	**Operation & Maintenance**					
		O&M Cost			2.50%	2.50%
		power plant		Rs Lakh	26.25	22.50
		Total O & M Expenses Escalation		%	3.93%	3.93%

Small Hydro Project (Island): Determination of Tariff, component for Below or equal to 5 MW

Fixed Cost	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
O&M Expenses	Rs Lakh	26.25	27.28	28.35	29.46	30.62	31.82	33.07	34.37	35.72	37.12	38.58	40.10	41.67	43.31	45.01	46.77	48.61	50.52	52.50	54.56	56.71	58.93	61.25	63.65	66.15	68.75	71.45	74.25	77.17	80.20	83.35	86.62	90.02	93.55	97.23
Depreciation	Rs Lakh	61.22	61.22	61.22	61.22	61.22	61.22	61.22	61.22	61.22	61.22	61.22	61.22	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15	9.15
Interest on term loan	Rs Lakh	76.84	70.16	63.48	56.81	50.13	43.45	36.77	30.10	23.42	16.74	10.06	3.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capita	Rs Lakh	5.31	5.22	5.14	5.06	4.98	4.90	4.83	4.76	4.69	4.62	4.55	4.49	3.45	3.53	3.61	3.70	3.78	3.88	3.97	4.07	4.18	4.29	4.40	4.52	4.64	4.76	4.89	5.03	5.17	5.32	5.47	5.63	5.80	5.97	6.15
Return on Equity	Rs Lakh	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07	61.07
Total Fixed Cost	**Rs Lakh**	**230.68**	**224.95**	**219.26**	**213.61**	**208.01**	**202.46**	**196.96**	**191.51**	**186.11**	**180.77**	**175.48**	**170.26**	**115.34**	**117.05**	**118.84**	**120.69**	**122.61**	**124.62**	**126.70**	**128.86**	**131.10**	**133.44**	**135.86**	**138.39**	**141.01**	**143.73**	**146.56**	**149.50**	**152.56**	**155.74**	**159.04**	**162.47**	**166.04**	**169.74**	**173.59**

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	0	0	0	0	0	0	0	0	0	0
Electricity Generatio	**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**

Total COG	RS./kwh	8.87	8.65	8.43	8.21	8.00	7.78	7.57	7.36	7.15	6.95	6.74	6.54	4.43	4.50	4.57	4.64	4.71	4.79	4.87	4.95	5.04	5.13	5.22	5.32	5.42	5.52	5.63	5.75	5.86	5.99	6.11	6.24	6.38	6.52	6.67
Discount Factor		1.00	0.91	0.82	0.75	0.68	0.61	0.56	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.26	0.23	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.07	0.06	0.05	0.05	0.04	0.04	0.04

Levelised Tariff Without Accumlated	RS./Unit	7.09
Levelised Depreciation Benefit	RS./Unit	0.48
Levelised Tariff With Accumlated	RS./Unit	6.61

Small Hydro Project (Island): Determination of Tariff, component for Above 5 MW and below or equal to 25 MW

Fixed Cost	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	25	25	25	25	25	25	25	25	25
O&M Expenses	Rs Lakh	22.50	23.38	24.30	25.26	26.25	27.28	28.35	29.46	30.62	31.82	33.07	34.37	35.72	37.12	38.58	40.09	41.67	43.30	45.00	46.77	48.61	50.51	52.50	54.56	56.70	58.93	61.24	63.65	66.14	68.74	71.44	74.24	77.16	80.19	83.34
Depreciation	Rs Lakh	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	52.47	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84	7.84
Interest on term loan	Rs Lakh	65.86	60.14	54.41	48.69	42.97	37.24	31.52	25.80	20.07	14.35	8.62	2.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interest on working Capital	Rs Lakh	4.55	4.48	4.41	4.34	4.27	4.20	4.14	4.08	4.02	3.96	3.90	3.85	2.95	3.02	3.09	3.17	3.24	3.32	3.41	3.49	3.58	3.67	3.77	3.87	3.97	4.08	4.19	4.31	4.43	4.56	4.69	4.83	4.97	5.12	5.27
Return on Equity	Rs Lakh	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35	52.35
Total Fixed Cost	**Rs Lakh**	**197.73**	**192.81**	**187.94**	**183.10**	**178.30**	**173.54**	**168.82**	**164.15**	**159.52**	**154.94**	**150.41**	**145.94**	**98.86**	**100.33**	**101.86**	**103.45**	**105.10**	**106.81**	**108.60**	**110.45**	**112.37**	**114.38**	**116.46**	**118.62**	**120.86**	**123.20**	**125.62**	**128.14**	**130.76**	**133.49**	**136.32**	**139.26**	**142.32**	**145.49**	**148.79**

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	0	0	0	0	0	0	0	0	0	0
Electricity 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**

Total COG	RS./kwh	7.60	7.41	7.22	7.04	6.85	6.67	6.49	6.31	6.13	5.96	5.78	5.61	3.80	3.86	3.92	3.98	4.04	4.11	4.17	4.25	4.32	4.40	4.48	4.56	4.65	4.74	4.83	4.93	5.03	5.13	5.24	5.35	5.47	5.59	5.72
Discount Factor		1.00	0.91	0.82	0.75	0.68	0.61	0.56	0.51	0.46	0.42	0.38	0.34	0.31	0.28	0.26	0.23	0.21	0.19	0.17	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.07	0.06	0.05	0.05	0.04	0.04	0.04

Levelised Tariff Without Accumlated	RS./Unit	6.08
Levelised Depreciation Benefit	RS./Unit	0.41
Levelised Tariff With Accumlated	RS./Unit	5.67