

Commission's Analysis and Decision

41. Regulation 13 of the RE Tariff Regulations 2020 specifies the debt equity ratio for project specific tariff as follows:

**“13. Debt Equity Ratio**

(1) *For determination of generic tariff and project specific tariff, the debt equity ratio shall be considered as 70:30:*

*Provided that, for project specific tariff, where the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan;*

*Provided further that for project specific tariff where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff;*

....

(2) *The project developer shall submit the resolution of the Board of the company or approval of the competent authority in other cases regarding infusion of funds from internal resources in support of the utilization made or proposed to be made to meet the capital expenditure of the renewable energy project.”*

42. As per Regulation 13 of the RE Tariff Regulations 2020, wherever the equity deployed is less than 30% of the Capital cost, the actual equity is be considered for determination of project specific tariff. Upon review of Board approval for 20% equity component along with the financial viability report and the principle specified in Regulation 13 of the RE Tariff Regulations 2020, the Commission has decided to consider the Debt Equity ratio of 80:20 for Kayamkulam Floating Solar PV Projects, as follows:

Table-4: Debt Equity Amount approved by the Commission

Particulars		As Proposed by the Petitioner		As considered by the Commission	
		Phase-1 (22MW )	Phase-2 (70MW )	Phase-1 (22MW )	Phase-2 (70MW )
Debt Component	(%)	70%	70%	80%	80%
Equity Component	(%)	30%	30%	20%	20%
Debt Component	Rs Lakh	8,123.17	28,740.30	9,211.20	32,289.57
Equity Component	Rs Lakh	3,481.36	12,317.27	2,302.80	8,072.39

## C. Loan Tenure and Interest on Loan

### Petitioner's Submission

43. The Petitioner has considered loan tenure of 15 years as per the RE Tariff Regulations 2020 for determination of project specific tariff. The Petitioner has claimed interest on loan capital as 9.38% after taking into consideration of the average State Bank of India MCLR (one-year tenor) prevalent during the six months period of 10.02.2020 to 10.07.2020 as 7.38%. The Petitioner has also submitted that no specific loan has been drawn for the project and the average State Bank of India MCLR (one-year tenor) prevalent during the six months period of 10.02.2020 to 10.07.2020 as 7.38% has been used to calculate interest on loan as 9.38% as per RE Tariff Regulations 2022.

### Commission's Analysis and Decision

44. Regulation 14 of the RE Tariff Regulations 2020 specifies the loan tenure of 15 years and the rate of interest as equivalent to SBI MCLR (one-year tenor) prevalent during the last available six months plus 200 basis points, for the purpose of determination of project specific tariff for RE projects, which is reproduced as follows:

#### ***“ 14 Loan Tenure and Interest on Loan***

##### ***(1) Loan Tenure***

*For determination of generic tariff and project specific tariff, loan tenure of 15 years shall be considered.*

##### ***(2) Interest on Loan***

*(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. For project specific tariff, the normative loan outstanding as on 1<sup>st</sup> of April of every year shall be worked out by deducting the cumulative repayment up to 31<sup>st</sup> March of previous year from the gross normative 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.”*

45. The Commission observes that the Petitioner has not taken any project specific loan and has considered average State Bank of India MCLR (one-year tenor) prevalent during the six months period of 10.02.2020 to 10.07.2020 as 7.38% when the Petition was filed.

46. The Commission notes that according to Clause (b) of Regulation 7 of RE Tariff Regulations 2020, the financial norms, except for capital cost, shall be ceiling norms for determining the project specific tariff. It would be pertinent to mention that the Commission while notifying the levelised generic tariff for renewable energy technologies for FY 2021-22 in its Order dated 31.03.2021 had considered the interest on loan as 9% [Average of six months for period of 10.07.2020 to 09.01.2021 SBI MCLR one-year tenor (7%) + 200 bps].

47. Accordingly, the Commission approves the Interest on Loan as 9% p.a.

#### **D. Depreciation**

##### *Petitioner' Submission*

48. The Petitioner has claimed the depreciation as 4.67% for the first 15 years of the project life and 2% thereafter spread over the useful life of the project. The salvage value of the asset has been considered as 10%.

##### *Commission's Analysis and Decision*

49. Regulation 15 of the RE Tariff Regulations 2020 specifies the principles for computation of depreciation as follows:

##### ***“15. Depreciation***

*(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.”

50. According to Clause (b) of Regulation 7 of the RE Tariff Regulations 2020, the financial norms, except for capital cost, shall be the ceiling norms for determining the project specific tariff. Accordingly, the salvage value of the asset is considered 10% and depreciation is allowed up to 90% of the capital cost. Further, the Commission has considered the depreciation at 4.67% for the first 15 years and 2% for the remaining period spread over the useful life of the project as proposed by the Petitioner.

Table-5: Depreciation approved by the Commission

Particulars	As proposed by the Petitioner	As Considered by the Commission
Useful Life	25 Years	25 Years
Debt	70%	80%
Repayment Period	15	15
Depreciation for 1 <sup>st</sup> 15 Years	4.67%	4.67%
Depreciation for 16 <sup>th</sup> year onward	2%	2%
Salvage Value as % of Capital Cost	10%	10%

## E. Return on Equity

### Petitioner' Submission

51. The Petitioner has claimed Return on Equity in terms of Regulation 16 of the RE Tariff Regulations 2020 as 14% grossed up at MAT rate for the first 20 years and Corporate Tax rate for remaining five years period of the project life. The Minimum Alternate Tax (MAT) rate and Corporate Tax rate considered by the Petitioner are 17.47% and 34.94%, respectively.

### Commission's Analysis and Decision

52. Regulation 16 of the RE Tariff Regulations 2020 specifies Return on Equity as follows:

## ***“16. Return on Equity***

- (1) The value base for equity shall be as determined under Regulation 13.*
- (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 Periods”*

53. The Commission in its generic tariff order in Petition No 2/SM/2021 for renewable energy project to be commissioned in FY 2021-22 had considered the MAT rate of 17.47% and Corporate Tax rate of 34.94%.

54. The Commission observes that the submission of the Petitioner is according to the RE Tariff Regulations 2020. Accordingly, the Commission has considered Return on Equity (ROE) as 16.96% i.e.  $14\% / (1 - 17.47\%)$  (after grossing up by MAT rate of 17.47% ) for the first 20 years of the project and as 21.52 % i.e.  $14\% / (1 - 34.94\%)$  (after grossing up by Corporate Tax rate of 34.94%) for the remaining five years of the useful life of the project.

## **F. Interest on Working Capital**

### *Petitioner’ Submission*

55. The Petitioner has claimed interest on working capital in terms of Regulation 17 of the RE Tariff Regulations 2020 as 10.88% after taking into consideration of the average State Bank of India MCLR (one-year tenor) prevalent during the six months period from 10.02.2020 to 10.07.2020 as 7.38%. Further, the Petitioner has computed the working capital requirement in accordance with the RE Tariff Regulations 2020 by considering Operational and Maintenance expenses for one-month, receivable equivalent to 45 days of tariff and maintenance spare equivalent to 15% of Operation and Maintenance expenses for determining the levelized tariff.

### *Commission’s Analysis and Decision*

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

#### ***“ 17. Interest on Working Capital***

*(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:*

- a) Operation & Maintenance expenses for one month*
- b) 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*
- c) Maintenance spares equivalent to 15% of Operation and Maintenance expenses.*

.....

*(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.”.*

57. It would be pertinent to mention that the Commission while notifying the levelised generic tariff for renewable energy technologies for FY 2021-22 in its Order dated 31.03.2021 had considered the interest on working capital as 10.5% (Avg. of six months SBI MCLR one-year tenor (7%) + 350 bps). Accordingly, the Commission has decided to consider 10.5% as interest on working capital for the purpose of tariff determination in the present petition.

## **G. Capacity Utilisation Factor (CUF)**

### *Petitioner's Submission*

58. The Petitioner has claimed the capacity utilisation factor (CUF) of 25.11% for the 22 MW phase-1 and 27.24 % for 70 MW phase-2 of Kayamkulam floating SPV Project. The Petitioner has submitted the quoted annual generation submitted by the successful contractor M/s BHEL for 22 MW Phase-1 as 48.42 MU and Ms/ Tata Power Solar System Ltd for 70 MW phase-2 as 167.5 MU of Kayamkulam Floating SPV Project during reverse auction based on reference global solar radiation at the project sites. This guaranteed annual generation under the reverse auction process has been considered for computation of CUF of the projects as 25.55% for 22 MW Phase-1 and as 27.24% for 70 MW Phase-2 by the Petitioner while calculating the levelized tariff.

59. It would be pertinent to mention that as per the power purchase agreement (PPA) signed between the Petitioner and the Respondent, the Petitioner is entitled to supply energy corresponding to minimum CUF of 16% and a maximum CUF of 28% from the said project in a

contract year to the Respondent. The Petitioner has submitted that the supply of solar power from the project would be at applicable tariff up to 28% CUF on annual basis. The over generation or excess energy above the CUF of 28% from the project shall be made available to the Respondent at 75% of the applicable tariff.

Commission's Analysis and Decision

60. Regulation 18 of the RE Tariff Regulations 2020, 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.”*

61. Regulation 47 of the RE Tariff Regulations 2020 specifies the norms for Capacity Utilization Factor (CUF) of units generated in a year in respect of the floating solar projects as follows:

**“47. Capacity Utilisation Factor**

*The Commission shall only approve capacity utilisation factor for project specific tariff:*

*Provided that the minimum capacity utilization factor for solar PV power projects shall be 21%:*

*Provided further that the minimum capacity utilization factor for solar thermal power projects shall be 23%:*

*Provided also that the minimum capacity utilisation factor for floating solar projects shall be 19%.*

62. As per the above Regulations, the capacity utilisation factor shall be approved by the Commission with a condition of minimum capacity utilisation factor of 19% for floating solar projects. The Commission observes that the Petitioner has considered a CUF of 25.11% for Phase-1 of 22 MW project and CUF of 27.24% for Phase-2 of 70 MW after considering the solar radiation available on the respective sites. The Commission also notes that the Petitioner has signed PPA with the Respondent corresponding to minimum CUF of 16% and a maximum CUF of 28% in a contract year. Upon review of the CUF guaranteed by the successful bidders and provisions of the PPA, the Commission decides to consider the CUF of 25.11% for Phase-1 of 22 MW project and CUF of 27.24% for Phase-2 of 70 MW for the computation of project specific tariff.

## H. Operation and Maintenance Expenses

### Petitioner's Submission

63. The Petitioner has submitted that the O&M of the projects after its commissioning for first three years is included in the project cost and the same is included in the scope of EPC contractor. Therefore, Petitioner has considered O&M cost of the projects for initial three (03) years as NIL. Thereafter, the Petitioner has considered O&M cost at the rate of Rs.3.5 lakh/ MW/ Year considering the project location with escalation at the rate of 3.84% per annum as per Regulation 19(2) of RE Tariff Regulations 2020.

### Commission's Analysis and Decision

64. Regulation 19 of the RE Tariff Regulations 2020 specifies the norms of Operation and Maintenance Expenses (O&M expenses) in respect of RE projects as follows:

#### *"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."*

65. Regulation 48 of the RE Tariff Regulations 2020 specifies the principle of determining the O & M expenses for floating solar projects as follows :

#### *" 48. Operation and Maintenance expenses*

*The Commission shall determine only project specific O&M expenses considering the prevailing market trends."*

66. The Commission notes the submission by the Petitioner about not considering the cost of O&M for the first three years of the project as it has been included in the EPC cost discovered through competitive bidding process. The Commission observes that the O & M cost applicable after three years of the commissioning of the projects is below 1% of the EPC cost and in line with the prevailing market practice. Accordingly, the Commission has considered the O& M expenses of Rs.3.5 lakh/ MW/ Year for both phase-1 of 22MW and phase-2 of 70 MW projects



as proposed by the Petitioner. Further, as specified in the Regulations, the escalation rate of 3.84% per annum shall be applicable on O & M expenses and hence, the Commission has considered an escalation rate of 3.84% per annum on O & M expenses as proposed by the Petitioner.

## **I. Auxiliary Consumption**

### Petitioner's Submission

67. The Petitioner has considered Auxiliary Power Consumption (APC) of 0.75% as per Regulation 49 of RE Tariff Regulations, 2020.

### Commission's Analysis and Decision

68. Regulation 49 of the RE Tariff Regulations specifies methodology to consider auxiliary consumption for floating solar projects as follows:

#### *“49. Auxiliary Consumption*

*The Commission shall only approve auxiliary consumption for project specific tariff:*

*Provided that the maximum auxiliary consumption for solar PV power projects shall be 0.75%;*

*Provided further that the maximum auxiliary consumption for solar thermal power projects shall be 10%;*

*Provided also that the maximum auxiliary consumption for floating solar projects shall be 0.75%*

69. As per the above Regulation the maximum 0.75% of auxiliary consumption has been allowed for floating solar projects. The Petitioner has not provided any further details regarding the auxiliary consumption. Accordingly, the Commission has decided to consider auxiliary consumption of 0.75% for both Phase-1 of 22MW and Phase-2 of 70 MW projects as proposed by the Petitioner.

## **J. Module Degradation**

### Petitioner's submission

70. The Petitioner has considered degradation factor of 0.7% per annum for Solar Module by citing reason that the same was included in the technical bid specification and is as per the normal industry practice.

Commission's Analysis and Decision

71. The Commission observes that the Petitioner has proposed Module degradation factor of 0.70%. However, as explained in the Statement of Reasons for the RE Tariff Regulations 2020, the quality and efficiency of Solar Module have increased over the period. Accordingly, the Commission has not considered the module degradation factor as proposed by the Petitioner while determining the project specific tariff in this case.

**K. Transmission losses**

Petitioner's submission

72. The Petitioner has considered loss of 1.25% on account of loss in power evacuation system consisting of Transformer loss (33 KV /220 KV), loss due to 33 KV cables and system availability loss for calculating energy sent out from the project for determination of tariff.

Commission's Analysis and Decision

73. The Commission observes that no specific details have been provided by the Petitioner for its claim of transmission loss of 1.25%. The Commission observes that as per the PPA, the metering shall be done at the interconnection point which is the interface point of Kayamkulam Floating Solar PV power plant with the STU/CTU transmission network at 220 KV level at the existing premises of RGCCP. The Detailed Project Report specifying the technical details for both the projects refers metering point for EPC contractor at 33 kV. As the Petitioner has not provided any details or justification for transmission loss, the Commission has decided not to consider transmission loss for the purpose of tariff determination in the present petition.

**L. Discount Factor**

Petitioner's Submission

74. The Petitioner has claimed discount factor of 9.63 % for the first 20 years of the project by considering the MAT rate and 8.47% for the remaining 5 years of the useful life of the project by considering the Corporate Tax rate.

Commission's Analysis and Decision

75. Regulation 10(2) of the RE Tariff Regulations 2020 specifies the methodology to calculate discount factor for the purpose of levelised tariff computation as under:

**“10. Tariff Design**

... ..

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

76. The Commission has consistently followed the practise of single discount rate and applied it to year on year cost to arrive at the levelized tariff and is of the view that the methodology is adequate.

77. In accordance with Regulation 10 of the RE Tariff Regulations 2020, the discount factor considered for the purpose of determination of tariff in this case is equal to the post tax weighted average cost of capital on the basis of approved debt-equity ratio (80:20). Interest Rate considered for the loan component (i.e., 80% of capital cost) is 9%. For equity component (i.e., 20% 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%. Accordingly, the discount factor derived by this method for this case is 7.48%.

$$\text{Discount Factor} = [(9\% \times 0.80) \times (1 - 34.94\%)] + (14.0\% \times 0.20) = 7.48\%$$

**Parameters Approved by the Commission**

78. The following table provides summary of various parameters approved by the Commission for determination of project specific tariff for both Phase-1 of 22MW and Phase-2 of 70 MW of Kayamkulam Floating Solar PV power project.

Table-6: Parameters approved by the Commission

Summary of Project Specific Parameters					As Proposed by the Petitioner		As Approved by the Commission	
Sl. No.	Head	Sub-Head(1)	Sub-Head(2)	Unit	Phase -1	Phase-2	Phase-1	Phase-2
1	Power Generation	Capacity	Installed Power Generation Capacity	MW	22	70	22	70
			Capacity Utilisation Factor	%	25.11	27.24	25.11	27.24
			Auxiliary Consumption	%	0.75	0.75	0.75	0.75
			Degradation loss	%	0.70	0.70	0	0
			Transmission Loss	%	1.25	1.25	0	0
			Useful Life	Years	25	25	25	25
2	Project Cost	Capital Cost/ MW	Normative Capital Cost	Rs Lakhs/MW	527.48	586.54	523.36	576.60
			Capital Cost	Rs (Lakh)	11604.52	41057.57	11514.0	40362.0
			Net Capital Cost	Rs (Lakh)	11604.52	41057.57	11514.0	40362.0
3	Financial Assumption	Debt: Equity	Tariff Period	Years	25	25	25	25
			Debt	%	70	70	80	80
			Equity	%	30	30	20	20
			Total Debt Amount	%	8123.17	28740.30	9211.20	32289.6
			Total Equity Amount	Rs (Lakhs)	3481.36	12317.27	2302.80	8072.40
		Debt Component	Loan Amount	Rs (Lakhs)	8123.17	28740.30	9211.20	32289.6
			Moratorium Period	Years	0	0	0	0
			Repayment Period (Including Moratorium)	Years	15	15	15	15
			Interest Rate	%	9.38	9.38	9	9
		Equity Component	Equity Amount	Rs (Lakhs)	3481.36	12317.27	2302.80	8072.40
			Return on Equity for first 20 years	% p.a.	16.96	16.96	16.96	16.96
			Return on Equity 21st Year onward	% p.a.	21.52	21.52	21.52	21.52
		Depreciation	Discount Rate for first 20 Years	%	9.62	9.62	7.48	7.48
			Discount Rate for last 5 Years	%	8.47	8.47	7.48	7.48
			Depreciation Rate for 1st 15 years	%	4.67	4.67	4.67	4.67
			Depreciation Rate 16 <sup>th</sup> year onwards	%	2	2	2	2
4	Operation & Maintenance	O&M expense per annum from 3rd year	Rs Lakhs/MW	3.5	3.5	3.5	3.5	
		Escalation factor for O&M expense	%	3.84	3.84	3.84	3.84	
5	Working Capital	O&M expense	Months	1	1	1	1	
		Maintenance Spare as % of O&M expenses	%	15	15	15	15	
		Receivables	Months	1.5	1.5	1.5	1.5	
		Interest on Working Capital	% p.a.	10.88	10.88	10.5	10.5	
6	Tariff	Levelised Tariff	Rs/ kWh	3.51	3.58	2.91	2.94	

## Tariff Approved by the Commission

79. Based on the parameters, assumptions and methodology outlined in earlier paragraphs, the levelized Tariff for Phase-1 of 22 MW works out to Rs.2.91 per kWh and that for Phase-2 of 70 MW works out to be Rs.2.94 per kWh. The detailed calculation is attached as Annexure. The Weighted average tariff calculated for 92 MW is Rs.2.94 per kWh.

Table-7: Tariff approved by the Commission

Weighted Average of 92 MW Floating SPV Project						
Sr. No.	Name of Floating SPV Power Project	Net Life time Generation Per MW (MU)	Net Life time Generation from project (MU)	Capital Cost (Rs. lakh)	Capital Cost (Rs. lakh/ MW)	Payable Levelised Tariff (₹/kWh)
1	22 MW Kayamkulam floating SPV Project	54.48	1198.52	11514.00	523.36	2.91
2	70 MW Kayamkulam floating SPV Project	59.10	4136.96	40362.00	576.60	2.94
3	<b>Weighted Average for 92 MW floating SPV Project</b>	<b>113.58</b>	<b>5335.49</b>	<b>51876.00</b>	<b>563.87</b>	<b>2.94*</b>

\* Levelised Tariff computed is Rs 2.937 per kWh which has been rounded off to Rs 2.94 per kWh.

80. Although the Petitioner is implementing the projects in two stages i.e. 22 MW and 70 MW, a single PPA has been signed with the Respondent for the total 92 MW capacity. Accordingly, the Commission determines the interim tariff for the electricity generated from the 92 MW Kayamkulam Floating Solar Plant of the Petitioner as Rs.2.94 per kWh. However, considering that the said project is yet to be commissioned, the Commission gives liberty to the Petitioner to approach the Commission with detailed break up of actual costs and other parameters, if required.

81. Annexure-1 and Annexure-1A given hereinafter form part of the order.

82. Accordingly, the Petition No. 341/GT/2019 is disposed of in terms of the above.

**Sd/-**  
**(Pravas Kumar Singh)**  
**MEMBER**

**Sd/-**  
**(Arun Goyal)**  
**MEMBER**

**Sd/-**  
**(I.S. Jha)**  
**MEMBER**

**Sd/-**  
**(P.K. Pujari)**  
**CHAIRPERSON**

## Annexure-1

### Determination of Tariff - Components for 22 MW Phase-1 Kayamkulam Floating Solar Project

Units Generation	Unit	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	Yr-16	Yr-17	Yr-18	Yr-19	Yr-20	Yr-21	Yr-22	Yr-23	Yr-24	Yr-25
Installed Capacity (For Calculation of Tariff)	MW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Degradation Loss	MU	0.000	0.000	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Generation after Degradation loss	MU	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Transmission Loss	MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aux Consumption	MU	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Net Generation	MU	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18	2.18
Tariff Components (Fixed Charge)	Unit	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	Yr-16	Yr-17	Yr-18	Yr-19	Yr-20	Yr-21	Yr-22	Yr-23	Yr-24	Yr-25
O&M Expenses	₹Lakhs	0.00	0.00	0.00	3.50	3.63	3.77	3.92	4.07	4.23	4.39	4.56	4.73	4.91	5.10	5.30	5.50	5.71	5.93	6.16	6.40	6.64	6.90	7.16	7.44	7.72
Depreciation	₹Lakhs	24.44	24.44	24.44	24.44	24.44	24.44	24.44	24.44	24.44	24.44	24.44	24.44	24.44	24.44	24.44	10.44	10.44	10.44	10.44	10.44	10.44	10.44	10.44	10.44	10.44
Interest on term loan	₹Lakhs	36.58	34.38	32.18	29.98	27.78	25.58	23.38	21.18	18.98	16.79	14.59	12.39	10.19	7.99	5.79	3.59	1.39	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	₹Lakhs	1.05	1.02	0.99	1.09	1.07	1.05	1.02	1.00	0.97	0.95	0.93	0.91	0.88	0.86	0.84	0.63	0.61	0.60	0.61	0.62	0.69	0.70	0.71	0.72	0.73
Return on Equity	₹Lakhs	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65	14.65
Tax on ROE	₹Lakhs	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	3.10	7.87	7.87	7.87	7.87
<b>Total Fixed Cost</b>	<b>₹Lakhs</b>	<b>79.83</b>	<b>77.60</b>	<b>75.37</b>	<b>76.77</b>	<b>74.68</b>	<b>72.60</b>	<b>70.52</b>	<b>68.45</b>	<b>66.38</b>	<b>64.32</b>	<b>62.27</b>	<b>60.22</b>	<b>58.18</b>	<b>56.15</b>	<b>54.12</b>	<b>37.92</b>	<b>35.91</b>	<b>34.88</b>	<b>34.97</b>	<b>35.21</b>	<b>40.30</b>	<b>40.56</b>	<b>40.84</b>	<b>41.12</b>	<b>41.42</b>
Per Unit Tariff Components	Unit	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	Yr-16	Yr-17	Yr-18	Yr-19	Yr-20	Yr-21	Yr-22	Yr-23	Yr-24	Yr-25
PU O&M Expenses	₹/kWh	0.00	0.00	0.00	0.16	0.17	0.17	0.18	0.19	0.19	0.20	0.21	0.22	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.32	0.33	0.34	0.35
PU Depreciation	₹/kWh	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	1.12	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48	0.48
PU Interest on term loan	₹/kWh	1.67	1.57	1.47	1.37	1.27	1.17	1.07	0.97	0.87	0.77	0.67	0.57	0.47	0.37	0.26	0.16	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PU Interest on working Capital	₹/kWh	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PU Return on Equity	₹/kWh	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
PU Tax on ROE	₹/kWh	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.36	0.36	0.36	0.36	0.36
<b>PU Tariff Components</b>	<b>₹/kWh</b>	<b>3.65</b>	<b>3.55</b>	<b>3.45</b>	<b>3.51</b>	<b>3.42</b>	<b>3.32</b>	<b>3.23</b>	<b>3.13</b>	<b>3.04</b>	<b>2.94</b>	<b>2.85</b>	<b>2.76</b>	<b>2.66</b>	<b>2.57</b>	<b>2.48</b>	<b>1.74</b>	<b>1.64</b>	<b>1.60</b>	<b>1.60</b>	<b>1.61</b>	<b>1.84</b>	<b>1.86</b>	<b>1.87</b>	<b>1.88</b>	<b>1.90</b>
Levelised Tariff	Unit	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	Yr-16	Yr-17	Yr-18	Yr-19	Yr-20	Yr-21	Yr-22	Yr-23	Yr-24	Yr-25
Discount Factors		1.00	0.93	0.87	0.81	0.75	0.70	0.65	0.60	0.56	0.52	0.49	0.45	0.42	0.39	0.36	0.34	0.32	0.29	0.27	0.25	0.24	0.22	0.20	0.19	0.18
Discounted Tariff Component	₹/kWh	3.65	3.30	2.99	2.83	2.56	2.32	2.09	1.89	1.71	1.54	1.38	1.25	1.12	1.01	0.90	0.59	0.52	0.47	0.44	0.41	0.44	0.41	0.38	0.36	0.34
<b>Levelised Tariff</b>	<b>₹/kWh</b>	<b>2.91</b>																								

## Annexure-1A

### Determination of Tariff - Components for 70 Mw Phase-2 Kayamkulam Floating Solar Project

Units Generation	Unit	Yr-1	Yr-2	Yr-3	Yr-4	Yr-5	Yr-6	Yr-7	Yr-8	Yr-9	Yr-10	Yr-11	Yr-12	Yr-13	Yr-14	Yr-15	Yr-16	Yr-17	Yr-18	Yr-19	Yr-20	Yr-21	Yr-22	Yr-23	Yr-24	Yr-25
Installed Capacity (For Calculation of Tariff)	MW	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gross Generation	MU	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39
Degradation Loss	MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Generation after Degradation loss	MU	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39	2.39
Transmission Loss	MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aux Consumption	MU	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Net Generation	MU	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37	2.37
<b>Tariff Components (Fixed Charge)</b>	<b>Unit</b>	<b>Yr-1</b>	<b>Yr-2</b>	<b>Yr-3</b>	<b>Yr-4</b>	<b>Yr-5</b>	<b>Yr-6</b>	<b>Yr-7</b>	<b>Yr-8</b>	<b>Yr-9</b>	<b>Yr-10</b>	<b>Yr-11</b>	<b>Yr-12</b>	<b>Yr-13</b>	<b>Yr-14</b>	<b>Yr-15</b>	<b>Yr-16</b>	<b>Yr-17</b>	<b>Yr-18</b>	<b>Yr-19</b>	<b>Yr-20</b>	<b>Yr-21</b>	<b>Yr-22</b>	<b>Yr-23</b>	<b>Yr-24</b>	<b>Yr-25</b>
O&M Expenses	₹Lakhs	0.00	0.00	0.00	3.50	3.63	3.77	3.92	4.07	4.23	4.39	4.56	4.73	4.91	5.10	5.30	5.50	5.71	5.93	6.16	6.40	6.64	6.90	7.16	7.44	7.72
Depreciation	₹Lakhs	26.93	26.93	26.93	26.93	26.93	26.93	26.93	26.93	26.93	26.93	26.93	26.93	26.93	26.93	26.93	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50	11.50
Interest on term loan	₹Lakhs	40.30	37.88	35.46	33.03	30.61	28.19	25.76	23.34	20.92	18.49	16.07	13.65	11.22	8.80	6.38	3.95	1.53	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on Working Capital	₹Lakhs	1.15	1.12	1.09	1.19	1.16	1.14	1.11	1.08	1.06	1.03	1.01	0.98	0.95	0.93	0.91	0.68	0.65	0.64	0.65	0.66	0.74	0.75	0.76	0.77	0.78
Return on Equity	₹Lakhs	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14	16.14
Tax on ROE	₹Lakhs	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	3.42	8.67	8.67	8.67	8.67	8.67
<b>Total Fixed Cost</b>	<b>₹Lakhs</b>	<b>87.95</b>	<b>85.49</b>	<b>83.04</b>	<b>84.21</b>	<b>81.90</b>	<b>79.59</b>	<b>77.28</b>	<b>74.98</b>	<b>72.69</b>	<b>70.40</b>	<b>68.12</b>	<b>65.85</b>	<b>63.58</b>	<b>61.32</b>	<b>59.07</b>	<b>41.19</b>	<b>38.96</b>	<b>37.80</b>	<b>37.87</b>	<b>38.12</b>	<b>43.70</b>	<b>43.96</b>	<b>44.24</b>	<b>44.52</b>	<b>44.82</b>
<b>Per Unit Tariff Components</b>	<b>Unit</b>	<b>Yr-1</b>	<b>Yr-2</b>	<b>Yr-3</b>	<b>Yr-4</b>	<b>Yr-5</b>	<b>Yr-6</b>	<b>Yr-7</b>	<b>Yr-8</b>	<b>Yr-9</b>	<b>Yr-10</b>	<b>Yr-11</b>	<b>Yr-12</b>	<b>Yr-13</b>	<b>Yr-14</b>	<b>Yr-15</b>	<b>Yr-16</b>	<b>Yr-17</b>	<b>Yr-18</b>	<b>Yr-19</b>	<b>Yr-20</b>	<b>Yr-21</b>	<b>Yr-22</b>	<b>Yr-23</b>	<b>Yr-24</b>	<b>Yr-25</b>
PU O&M Expenses	₹/kWh	0.00	0.00	0.00	0.15	0.15	0.16	0.17	0.17	0.18	0.19	0.19	0.20	0.21	0.22	0.22	0.23	0.24	0.25	0.26	0.27	0.28	0.29	0.30	0.31	0.33
PU Depreciation	₹/kWh	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49
PU Interest on term loan	₹/kWh	1.70	1.60	1.50	1.39	1.29	1.19	1.09	0.98	0.88	0.78	0.68	0.58	0.47	0.37	0.27	0.17	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PU Interest on working Capital	₹/kWh	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
PU Return on Equity	₹/kWh	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68	0.68
PU Tax on ROE	₹/kWh	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.37	0.37	0.37	0.37	0.37
<b>PU Tariff Components</b>	<b>₹/kWh</b>	<b>3.71</b>	<b>3.61</b>	<b>3.50</b>	<b>3.55</b>	<b>3.46</b>	<b>3.36</b>	<b>3.26</b>	<b>3.16</b>	<b>3.07</b>	<b>2.97</b>	<b>2.87</b>	<b>2.78</b>	<b>2.68</b>	<b>2.59</b>	<b>2.49</b>	<b>1.74</b>	<b>1.64</b>	<b>1.59</b>	<b>1.60</b>	<b>1.61</b>	<b>1.84</b>	<b>1.85</b>	<b>1.87</b>	<b>1.88</b>	<b>1.89</b>
<b>Levelised Tariff</b>	<b>Unit</b>	<b>Yr-1</b>	<b>Yr-2</b>	<b>Yr-3</b>	<b>Yr-4</b>	<b>Yr-5</b>	<b>Yr-6</b>	<b>Yr-7</b>	<b>Yr-8</b>	<b>Yr-9</b>	<b>Yr-10</b>	<b>Yr-11</b>	<b>Yr-12</b>	<b>Yr-13</b>	<b>Yr-14</b>	<b>Yr-15</b>	<b>Yr-16</b>	<b>Yr-17</b>	<b>Yr-18</b>	<b>Yr-19</b>	<b>Yr-20</b>	<b>Yr-21</b>	<b>Yr-22</b>	<b>Yr-23</b>	<b>Yr-24</b>	<b>Yr-25</b>
Discount Factors		1.00	0.93	0.87	0.81	0.75	0.70	0.65	0.60	0.56	0.52	0.49	0.45	0.42	0.39	0.36	0.34	0.32	0.29	0.27	0.25	0.24	0.22	0.20	0.19	0.18
Discounted Tariff Component	₹/kWh	3.71	3.36	3.03	2.86	2.59	2.34	2.11	1.91	1.72	1.55	1.40	1.26	1.13	1.01	0.91	0.59	0.52	0.47	0.44	0.41	0.44	0.41	0.38	0.36	0.33
<b>Levelised Tariff</b>	<b>₹/kWh</b>	<b>2.94</b>																								