



नई दिल्ली  
NEW DELHI

याचिका संख्या./ Petition No. 341/GT/2019

कोरम/ Coram:

श्री पी. के. पुजारी, अध्यक्ष/ Shri P. K. Pujari, Chairperson

श्री आई. एस. झा, सदस्य/ Shri I.S. Jha, Member

श्री अरुण गोयल, सदस्य/ Shri Arun Goyal, Member

श्री प्रवस कुमार सिंह, सदस्य/ Shri Pravas Kumar Singh, Member

आदेश दिनांक/ Date of Order: 9<sup>th</sup> of May, 2022

**In the matter of:**

Petition under Sections 62 and 79 (1) (a) of the Electricity Act, 2003 read with Chapter-V of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 along with “CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2020” for determination of project specific levelised tariff for 92 MW floating solar Photo Voltaic Plants in two phases (first phase 22 MW and second phase 70 MW) at Rajiv Gandhi Combined Cycle Power Project (RGCCP), Kayamkulam, Kerala

**And**

**In the matter of**

**NTPC Limited,**  
NTPC Bhawan,  
Core-7, Scope Complex,  
7, Institutional Area, Lodhi Road.  
New Delhi-110 003

..... **Petitioner**

**Versus**

**Kerala State Electricity Board (KSEB) Limited,**  
Vydyuthi Bhavan, Pattom,

Thiruvananthapuram,  
Kerala-695004

..... Respondent

**Parties Present:**

Ms. Swapna Seshadri, Advocate, NTPC  
Shri Anand K Ganesan Advocate, NTPC  
Ms. Ritu Apurva, Advocate, NTPC  
Shri Jai Dhanani, Advocate, NTPC  
Shri P.V Dinesh, Advocate, KSEBL

**आदेश / ORDER**

**Background**

The Petitioner, NTPC Limited is a Government Company within the meaning of the Companies Act, 1956. Further, it is a ‘Generating Company’ as defined under Section 2(28) of the Electricity Act, 2003.

2. The Respondent, Kerala State Electricity Board Limited (KSEBL) is an integrated State public sector power utility company constituted by the State Government which is carrying out Generation, Transmission and Distribution functions.

3. A Memorandum of Understanding (MOU) was signed between the Petitioner and the Respondent on 11-05-2018 to explore the possibility of setting up renewable power generation projects more specifically land-based and floating solar plants subject to their feasibility.

4. Based on the MOU, the Petitioner had initiated the bidding process for selection of Engineering Procurement and Commissioning (EPC) Contracts for setting up 92 MW floating solar photo voltaic plants in two phases (first phase 22 MW and second phase 70 MW) at Rajiv Gandhi Combined Cycle Power Project (RGCCP), Kayamkulam, Kerala, (in short “Kayamkulam floating SPV Project”) through two (02) separate International Competitive Bidding (ICB) based tenders. After conclusion of the tendering process as per the above including Reverse Auction among shortlisted agencies, the project has been awarded to M/S BHEL for 22 MW floating Solar Project and M/S Tata Power Solar Systems Limited for 70 MW floating Solar Project.

5. The Petitioner and the Respondent initialled a draft Power Purchase Agreement (PPA) agreeing to the terms and conditions set therein for the procurement of power from Kayamkulam floating SPV Project. According to Article 6 of the draft PPA, the tariff shall be computed based on the EPC cost discovered through competitive bidding. Further the tariff, payable by the Respondent, for the energy up to a maximum 28% CUF supplied at the delivery point from Kayamkulam floating SPV Project shall be at Rs.3.16 per kWh, subject to the approval of the Kerala State Electricity Regulatory Commission (KSERC).

6. Accordingly, the Respondent filed a petition before KSERC for approval of the draft PPA for Kayamkulam MW floating SPV Project. The KSERC, vide its Order dated 24-07-2019 in Petition No. OP 46/19, observed that as per the Clause (a) of Sub Section (1) of Section 79 of the Electricity Act, 2003 (in short “the Act”), the authority for determination of tariff of electricity generated from the said project installed by the Petitioner is vested with the Central Commission and granted provisional approval to the draft PPA subject to the modifications under Article 6.1 of the draft PPA as below :

*“Article 6.1 The Tariff shall be computed by NTPC based on EPC Cost discovered through competitive bidding followed by Reverse Auction. The tariff for energy upto a maximum CUF of 28% supplied at the delivery point from any of the Module of “Kayamkulam Floating Solar PV Station” shall be payable by KSEBL ‘at the tariff determined by CERC based on the petition filed by NTPC Ltd as per Section 62 of the Electricity Act, 2003 or at Rs. 3.16 per kWh, whichever is lower.’ If during any contract year, it is found that the Developer has not been able to supply energy corresponding to minimum CUF of 16% on account of reasons solely attributable to the Developer, the Developer shall pay penalty equal to 25% of the project tariff to KSEBL, for such shortfall in units. In case the availability is more than the maximum CUF of 28%, the Developer will be free to sell it to any other entity, provided, first right of refusal will vest with KSEBL. In case the KSEBL purchases the excess generation, it will do so at 75% (seventy-five percent) of the tariff. The applicable tariff as above shall be subject to approval of the Kerala State Electricity Regulatory Commission (KSERC) and the Tariff so arrived will be the tariff inclusive of all taxes, levies and duties.”*

7. The relevant extract of the KSERC Order dated 24-07-2019 in Petition no. OP 46/19 is as under:

“21. ....

(1) *The tariff for the electricity generated from the 92 MW floating solar plant to be developed by NTPC limited at its RGCCPP at Kayamkulam shall be the lower of the ‘tariff to be determined by CERC based on a petition filed by NTPC limited as per the provisions of electricity act 2003 for the mutually agreed tariff of ₹3.16/unit between the petitioner and respondent, whichever is lower.*

(2) *The respondent NTPC limited shall immediately file a petition before the CERC for determination of tariff for the electricity generated from the 92 MW floating solar plant at its RGCCPP at Kayamkulam as per the provisions of Electricity act 2003, with all supporting details.*

(3) *Provisionally approve the draft initiated PPA submitted before this commission for approval, with the modifications under Article 6.1 of the PPAs as detailed under paragraph 20 above.*

(4) *Immediately after CERC determines the tariff for the electricity generated from the 92 MW Floating Solar Plant, KSEB Ltd shall file a separate petition before this commission for the final approval of the PPA to be signed with the respondent NTPC Ltd.”*

8. Accordingly, the Petitioner filed the present petition before this Commission for determination of tariff for Kayamkulam floating SPV Project as directed by the KSERC and as per the provision incorporated in the final PPA signed by the parties on 28.08.2019.

9. Meanwhile, the Commission notified CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2020” (hereinafter ‘RE Tariff Regulations 2020’).

10. The Petitioner has sought approval of the levelized tariff and claimed that the tariff calculated based on the parameters mentioned in RE Tariff Regulations 2020 is Rs.3.51/kWh for 22 MW and Rs.3.58/kWh for 70 MW. The weighted average tariff calculated for 92 MW is Rs.3.56/kWh.

11. While claiming that the tariff computation is based on the various relevant provisions of the RE Tariff Regulations 2020, the Petitioner has also sought approval for deviation from the norms or principles specified in the RE Tariff Regulations 2020, to take into account the module degradation of 0.7% per annum, higher Auxiliary Power Consumption (APC) of 0.75%, transmission loss of 1.25%, additional expenditure of Rs.50.77 Crore towards construction of 7 KM long motorable road to have access to waterbodies for 70 MW Phase-2 project.

12. The prayers of the Petitioner are as follows:

- a) *Determine and approve the levelised tariff for Kayamkulam 92 MW Floating SPV Project;*
- b) *Grant interim order to facilitate billing at proposed tariff;*
- c) *Issue any other order as deemed fit in such case.*

13. Accordingly, the matter was called out for hearing on 25.11.2019, 17.07.2021 and 21.12.2021. During the course of the hearing, the learned counsel of the Petitioner submitted that though the scheduled commissioning date (SCD) for Phase-1 of 22MW was 23.02.2021 and that for Phase-2 of 70 MW was 23.08.2021, the project has not been commissioned till date (21.12.2021).

#### **Submission of the Petitioner**

14. The Petitioner has submitted as under:

- a) The project is being setup on the basis of MoU signed between the Respondent and the Petitioner on 11-05-2018. After the signing of MOU, the Petitioner initiated the tendering process. After conclusion of tendering process as per the above including Reverse Auction among shortlisted agencies, the project has been awarded to M/S BHEL for 22 MW floating Solar Project (Rs.2,27,41,085.94 per MU) and M/S Tata Power Solar Systems Limited for 70 MW floating Solar Project (Rs.2,05,11,012.98 per MU)
- b) The Petitioner is implementing the project in two stages i.e. 22 MW and 70 MW. However, a single PPA has been signed with KSEBL for the total capacity of 92 MW. Therefore, the weighted average tariff for the total capacity of 92 MW is being

submitted for approval along with tariff calculations for the individual stages of 22 MW and 70 MW.

- c) No subsidy/incentive is received from the Central Government or the State Government by NTPC. The tariff claimed is based on awarded cost for the project development one for 22 MW and another for 70 MW aggregating to capacity of 92 MW. The tariff calculated based on the parameters mentioned in the aforesaid paragraph is Rs.3.51/kWh for 22 MW and Rs.3.58/kWh for 70 MW. The weighted average tariff calculated for 92 MW is ₹3.56/kWh. Details of the two tenders are presented in the table below:

Particulars	22 MW	70 MW
Type of Bidding	ICB	
Mode of Tendering	e-tendering; Single Stage Two Envelopes followed by Reverse Auction (RA)	
Date of Invitation for Bids	25-06-2018	15-10-2018
Date of Technical Bid Opening	31-08-2018	10-01-2019
Number of bidders participated	10	10
Date of Reverse Auction	29-10-2018	24-01-2019
Number of bidders shortlisted for the reverse auction	08	08
Name of the Successful bidder (L1 bidder after closure of reverse auction)	Bharat Heavy Electricals Limited	Tata Power Solar Systems Limited
L1 Price (per MU) after the closure of RA	Rs.22741085.94	Rs.20511012.98

- d) The Scheduled Commercial operation date (SCOD) for the 22 MW floating SPV Power Project was 23.02.2021 i.e. 15 months from the date of issuance of Notification of Award (NOA) and that of 70 MW floating solar SPV Power Project was 23.08.21 i.e. 21 months from the date of issuance of notice of award (NOA). NOA date for both the projects was 24th Sep 2019.
- e) Treatment of over-generation: The supply of solar power from the project will be at applicable tariff up to 28% CUF on Annual basis. The over generation or excess energy above 28% CUF shall be made available to KSEB Limited at 75% of the applicable tariff.

- f) The project is one of the initial large sized floating solar projects and the ceiling tariff of Rs.3.16/kWh for the above project is comparable to the tariff discovered for Solar PV projects in competitive bidding conducted by various States at the time of EPC tendering conducted by the Petitioner.

### **Submission of Respondent**

15. The Respondent in its reply have submitted as under:
- a) The Petitioner has not provided the detailed estimate of Rs.57.14 lakh/MW in 70 MW project towards 7 KM motorable road.
  - b) The transmission loss considered by the Petitioner towards evacuation system is very high without any justification.
  - c) The tariff is only Rs.3.12 per unit for floating solar plant developed by the Petitioner at Ramagundam Super Thermal Project.

### **Rejoinder of the Petitioner**

16. In response to the reply, the Petitioner submitted as under:
- a) 7 KM long motorable road is required to be constructed to have access to the water bodies and floating solar panels of 70 MW Phase-2 of the Project and the same shall be executed through deposit works by Kerala Irrigation Department. The Assistant Executive Engineer, Irrigation Sub Division, Mavelikkara Kerala Irrigation Department has forwarded the cost estimate for Rs.50.77 Crore. Accordingly, the Petitioner has calculated the revised tariff for the instant project based on the expenditure estimate of ₹50.77 Crore which corresponds to Rs.72.53 lakh per MW for 70 MW floating solar project in the Capital Cost of the Project.
  - b) Transmission loss has been considered due to loss in power evacuation system consisting of Transformer loss (33 KV /220 KV), loss due to 33 KV cables.
  - c) With regard to the comparison of 92 MW Kayamkulam floating SPV project tariff with 100 MW Ramagundam Floating Solar PV project tariff, the Petitioner submitted that tariffs in both the projects are based on International Competitive Bidding (ICB) and concluded after Reverse Auction (RA) process. The scope of work in the above two projects is also not similar as mentioned hereunder:
    - (i) Kayamkulam floating Solar Project evacuation system envisages Outdoor yard (33/220 kV) for stepping up to 220 kV and final termination at 220 kV GIS at

Kayamkulam. In case of Ramagundam floating Solar project, the termination is at 33 kV Owner's Switchgear.

- (ii) Kayamkulam floating solar project includes construction of 7 Km long motorable road to be constructed at an estimated cost of Rs.50.77 Crore.

### **Analysis and Decision**

17. The Commission has examined copies of the bid documents, letter of award to successful bidders, the detailed project report outlining the technical and operational details along with the power purchase agreement signed by both the parties. The Commission has also taken into consideration the submission by the Petitioners and the Respondents along with oral submission made by the parties during the hearing process.

18. The Scheduled Commercial Operation Date (SCOD) for Phase-1 of 22MW was 23.02.2021 and that of for Phase-2 of 70 MW was 23.08.2021. However, during the hearing dated 21.12.2021, the Petitioner informed that the project has not been commissioned till date (21.12.2021).

19. In view of the fact that the SCOD of the project is envisaged during the control period (1.7.2020 to 31.3.2023) of the RE Tariff Regulations 2020, the Commission vide letter dated 16.07.2020 for technical validation granted liberty for filing amended tariff petition in accordance with the provisions of RE Tariff Regulations 2020. Accordingly, the Petitioner has filed this amended petition for determination of project specific levelised tariff for Kayamkulam Floating Solar PV Project as per RE Tariff Regulations 2020.

20. The Commission notes that the both parties have agreed that the tariff applicable for the Kayamkulam Floating Solar PV project shall be lower of Rs.3.16 per kWh or the tariff determined by this Commission. Further, the project has not been commissioned till the last hearing held on the subject matter on 21.12.2021. Accordingly, the Commission has decided to determine the interim tariff for the Kayamkulam Floating Solar PV project based on the relevant principles and methodology applicable for project specific tariff as specified in the RE Tariff Regulations 2020; the levelised generic tariff order (dated 31.03.2021 in Petition No 2/SM/2021) for FY 2021-22; and based on relevant information furnished by the Petitioner.

21. Regulation 7 of the RE Tariff Regulations 2020 provides general principles for determination of project specific tariff for generation of electricity from renewable energy station



including floating solar projects specifying that the financial and operational norms specified in the RE Tariff Regulations 2020, shall be considered as the ceiling norms except for capital cost.

**“7. Project Specific tariff**

a) *Project specific tariff, on case to case basis, shall be determined by the Commission for the following types of renewable energy projects:*

- i. *Solar PV power projects, floating solar projects and solar thermal power projects;*
- ii. *Wind power projects (both on-shore and off-shore);*
- iii. *Biomass gasifier based power projects and biogas based power projects – if a project developer opts for project specific tariff;*
- iv. *Municipal solid waste based power projects and refuse derived fuel based power projects;*
- v. *Renewable hybrid energy projects;*
- vi. *Renewable energy with storage projects; and*
- vii. *Any other project based on new renewable energy sources or technologies approved by MNRE.*

b) *Financial and operational norms specified in these regulations, except for capital cost shall be the ceiling norms while determining the project specific tariff.”*

22. Regulation 8 (2) of the RE Tariff Regulations 2020 specifies the formats and information which need to be accompanied with project specific tariff petition which reads as follows:

**“8. Petition and proceedings for determination of tariff**

.....

*(2) A petition for determination of project specific tariff shall be accompanied by such fee as may be specified in the Central Electricity Regulatory Commission (Payment of Fees) Regulations, 2012 as amended from time to time or any subsequent re-enactment thereof, and shall be accompanied by:*

- a) *Information in forms 1.1, 1.2, 2.1, 2.2 and 2.3, as the case may be, as appended to these regulations;*
- b) *Detailed project report outlining technical and operational details, site specific aspects, basis for capital cost, detailed break-up of capital cost and financing plan;*
- c) *A statement of all applicable terms and conditions and anticipated expenditure for the period for which tariff is to be determined;*

- d) *A statement containing details of calculation of any grant or subsidy or incentive received, due or assumed to be due, from the Central Government or State Government or both. This statement shall also include the proposed tariff calculated without such subsidy or incentive;*
- e) *Consent from beneficiary for procurement of power from renewable energy project at tariff approved by the Commission, in the form of initialled Power Purchase Agreement or Memorandum of Understanding; and*
- f) *Following documents in case of petition for determination of project specific tariff by renewable energy projects, where tariff from such renewable energy sources is generally determined through competitive bidding process in accordance with provisions of Section 63 of the Act:*
  - i. *Rationale for opting project specific tariff instead of competitive bidding; and*
  - ii. *Competitiveness of the proposed tariff vis-à-vis tariff discovered through competitive bidding/ tariff prevalent in the market.*
- g) *Any other information directed by the Commission.”*

23. Regulation 10 of the RE Tariff Regulations 2020 specifies parameters of tariff for the renewable energy project as single tariff consisting of the following components:

- (a) Return on equity;
- (b) Interest on loan;
- (c) Depreciation;
- (d) Interest on working capital; and
- (e) Operation and Maintenance expenses

24. Regulation 11 of the RE Tariff Regulations 2020 provides tariff design principles for determination of project specific tariff on levelized basis considering the year of commissioning of the project for the tariff period of the project with discount factor equivalent to post-tax weighted average cost of capital.

**“10. Tariff Design**

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

*Provided that for renewable energy projects having single part tariff with two components, fixed cost component shall be determined on levelized basis considering the year of*

*commissioning of the project while fuel cost component shall be determined on year of operation basis in the Tariff Order to be issued by the Commission.*

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

*(3) The above principles shall also apply for project specific tariff.”*

25. Accordingly, the Commission has determined the project specific levelised tariff for the Kayamkulam Floating Solar PV project considering the financial and operational norms as ceiling norms wherever required as specified in the RE Tariff Regulations 2020. Chapter 7 of the RE Tariff Regulations 2020 specify the technical and operational parameters for floating solar projects.

26. Further, financial parameters as estimated in the latest levelized generic tariff Order dated 31.03.2021 in Petition No. 2/SM/2021 for FY 2021-22 have been considered by the Commission wherever required.

27. The Commission has, in addition to the above-mentioned principles specified in the RE Tariff Regulations 2020, also made certain assumptions and taken into consideration the input values submitted by the Petitioners and the submissions made by the Respondent as elaborated in the subsequent sections of this Order.

#### **A. Capital Cost**

##### *Petitioner's submission*

28. The Petitioner has submitted that the project is being setup on the basis of the MOU signed between the Respondent and the Petitioner on 11-05-2018. After the signing of the MOU, the Petitioner had initiated the tendering process for implementation of floating solar PV projects in two phases i.e. 22 MW and 70 MW Floating Solar PV Project at NTPC-Rajiv Gandhi Combined Cycle Power Station (RGCCP), Kayamkulam, Kerala through two (02) separate International Competitive Bidding (ICB) tenders. After conclusion of the tendering process as per the above including Reverse Auction among shortlisted agencies, the project has been awarded to M/S BHEL for 22 MW floating Solar Project and to M/S Tata Power Solar Systems Limited for 70 MW floating Solar Project. with EPC discovered cost as Rs. 2,27,41,085.94 per MU for 22 MW Phase -1 and Rs. 2,05,11,012.98 per MU for 70 MW Phase-2. The Petitioner has

estimated EPC cost per MW based on discovered cost per MU and annual generation of 48.42 MUs for Phase-1 of 22 MW and 167.15 MUs for Phase-2. Thus, EPC Costs per MW proposed by the Petitioner are Rs.500.51 lakh per MW for Phase-1 of 22 MW and Rs.489.77 lakh per MW for Phase-2 of 70 MW.

29. The Petitioner has submitted the details of capital cost as follows:

Table-1: Capital cost as proposed by the Petitioner

<b>Capital Cost of the Project</b>		<b>Phase-1 (22MW )</b>	<b>Phase-2 (70MW )</b>
Preliminary Cost	₹Lakhs / MW	3	3
Land Cost- Leasehold	₹Lakhs/ MW	0	0
Land Cost- Freehold	₹Lakhs/MW	0	0
EPC Cost	₹Lakhs/MW	500.51	489.77
Infrastructure Cost	₹Lakhs/MW	0	72.53
Project Management (@0.50%)	₹Lakhs/ MW	2.52	2.83
Contingency (@0.50%)	₹Lakhs/ MW	2.53	2.84
Interest During Construction (IDC) Period	₹Lakhs/ MW	18.92	15.57
<b>Capital Cost (Including IDC) per MW</b>	₹Lakhs/ MW	527.48	586.54
<b>Capital Cost for Project</b>	<b>₹Lakhs</b>	<b>116,04.52</b>	<b>410,57.57</b>
<b>Total Project Cost (92 MW)</b>	<b>₹Lakhs</b>	<b>526,62.09</b>	

30. As shown in the table above, the Petitioner has considered the EPC cost as discovered through the bidding process while other parameters like Preliminary Cost, Infrastructure Cost, Project Management Cost and Contingency Cost on lumpsum basis. As regards the infrastructure cost of Rs.72.53 lakh per MW, the Petitioner has argued that the same is proposed as per the estimation received from Kerala Irrigation Department for construction of 7KM long motorable road to have access to the water bodies and floating solar panels for Phase-2 of 70 MW. A communication from the Kerala Irrigation department in this regard providing detailed estimation of the construction has also been submitted to support the estimate.

31. Subsequently, the Petitioner, in compliance with the Commission's directions, has submitted the relevant extracts from the minutes of the 477<sup>th</sup> Meeting Board of Directors held on 21<sup>st</sup> September, 2019 approving the investment proposal for Kayakulam floating Solar PV

Projects 92 MW (22MW and 70 MW) with estimated cost of Rs.518.76 Crore including Interest During construction (IDC).

Commission's Analysis and Decision

32. Regulation 12 of the RE Tariff Regulations 2020 specifies the definition of Capital Cost as follows:

***“ 12. Capital Cost***

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

33. Regulation 46 of the RE Tariff Regulations 2020 specifies that the capital cost for the project specific tariff shall be determined considering the prevailing market trends. Regulation 46 is reproduced below for ready reference:

***“ 46. Capital cost***

*The Commission shall determine only project specific capital cost considering the prevailing market trends.”*

34. Upon examining the documents submitted in support of the capital cost, the Commission observes that the EPC cost provided by the Petitioner includes the cost associated with Module, Inverter, Transformer, ABT meter, SCADA, Installation erection, civil works, evacuation cost, and O& M cost of 3 years, along with the GST payable on all these services. As submitted by the Petitioner, the EPC cost is based on the competitive bidding followed by the reverse auction method and hence represents the prevailing market trends. Accordingly, the Commission approves the EPC cost discovered through bidding process as Rs.500.51 lakh per MW for Phase-1 of 22 MW and Rs.489.77 lakh per MW for Phase-2 of 70 MW of the RGCCP Kayamkulam Floating Solar Project.

35. The Preliminary Cost, Project Management Cost and Contingency Cost as submitted by the Petitioner is 1.5% of the project cost for both 22MW and 70 MW. The Commission finds this claim to be reasonable based on the analysis of the Commission on this aspect in the past when the Commission used to determine generic tariff for solar projects (last such exercise was done

by the Commission for the period 2016-17). Hence, the Commission approves the Preliminary Cost, Project Management cost and Contingency Cost as proposed by the Petitioner.

36. The Commission also observes that the cost proposed by the Petitioner for 7 KM motorable road for Phase-2 of 70MW is as per the detailed estimation received from the Kerala Irrigation Department to construct motorable Road and construction of bund for protecting the water body and hence approves the infrastructure cost of Rs.50.77 Crore for construction of 7KM long motorable road to have access to the water bodies and floating solar panels for Phase-2 of 70 MW.

37. The capital cost proposed by the Petitioner is Rs.116,04.52 lakh for 22 MW Phase-1 and Rs.41057.57 lakh for 70MW Phase-2, totalling Rs.526,62.09 lakh (Rs.526.62 Crore) for the entire 92 MW Kayamkulam floating Solar PV Projects. However, the capital costs approved by the Board of Directors of the Petitioner in its meeting dated 21.09.2019 based on the financial appraisal report for independent verification of financial viability of the Project are Rs.115.14 Crore for Phase-1 of 22 MW and Rs.403.62 Crore for Phase-2 of 70 MW. Thus, the total cost approved by the Board of Directors of the Petitioner is Rs.518.76 Crore for the combined Project of 92 MW Kayamkulam Floating Solar PV Projects. Since, the project is yet to be commissioned as informed by the Petitioner during the last hearing and the actual cost of the project is not yet known, the Commission approves that cost of the project as Rs.518.76 Crore for the purpose of determination of project specific tariff.

38. The cost towards Interest During construction (IDC) considered by the Petitioner is Rs.18.92 lakh per MW for 22MW and Rs.15.57 lakh per for 70 MW. The Petitioner has not provided any further details regarding the cost toward IDC. The Commission notes that the Capital Cost per MW consists of Preliminary cost, EPC cost, Infrastructure Cost, Project Management Cost, Contingency Cost and IDC cost, as per the submission of the Petitioner. In the preceding paras, the Commission has already approved the Capital Cost and other sub-components of the Capital Cost, except IDC. Accordingly, the IDC cost has been determined after subtracting the components such as EPC Cost, Preliminary Cost, Infrastructure Cost, Project Management Cost, Contingency Cost from the total approved Capital Cost for the project as approved by the Commission. Accordingly, the IDC for Phase-1 of 22 MW works out to be Rs.14.81 lakh/MW and that for Phase-2 of 70 MW as Rs.5.63 lakh per MW, as indicated in the table below:

Table-2: The Cost towards IDC approved by the Commission

Interest During Construction (IDC) (per MW)		Phase-1 (22MW )	Phase-2 (70MW )
Interest During Construction (IDC) / MW	₹Lakhs/ MW	14.81	5.63

39. Based on the above analysis, the Commission approves the Capital Cost of Rs.11,514 lakh for 22 MW and Rs.40,361.96 lakh for 72 MW of Kayamkulam floating Solar PV Projects as follows:

Table-3: Capital cost approved by the Commission

Capital Cost of the Project (per MW)		Phase-1 (22MW )	Phase-2 (70MW )
Preliminary Cost	₹Lakhs / MW	3	3
Land Cost- Leasehold	₹Lakhs / MW	0	0
Land Cost- Freehold	₹Lakhs / MW	0	0
EPC Cost	₹Lakhs / MW	500.51	489.77
Infrastructure Cost	₹Lakhs / MW	0	72.53
Project Management (@0.50%)	₹Lakhs / MW	2.52	2.83
Contingency (@0.50%)	₹Lakhs / MW	2.53	2.84
Interest During Construction (IDC)	₹Lakhs / MW	14.81	5.63
<b>Project Cost (Including IDC) per MW</b>	₹Lakhs / MW	523.36	576.60
<b>Capital Cost for Project</b>	<b>₹Lakhs</b>	<b>11,514.00</b>	<b>40,361.96</b>
<b>Total Project Cost (92 MW)</b>	<b>₹Lakhs</b>		<b>51,875.96</b>

## B. Debt Equity Ratio

### Petitioner's Submission

40. The Petitioner has considered normative Debt: Equity Ratio of 70: 30 for determination of the project specific tariff for 22 MW Phase-1 and 70 MW phase-2. However, in compliance with the direction of the Commission during the hearing, the Petitioner has submitted Board approval along with other supporting documents for equity component of the entire project of 92 MW and has claimed 20% equity component for the entire project of 92 MW.