KERALA STATE ELECTRICITY REGULATORY COMMISSION
THIRUVANANTHAPURAM

Present : Adv. A.J Wilson, Member (Law)

OP No 65/2021

In the matter of	:	Petition filed by CIAL Infrastructures Ltd for approval of PPA and to determine generic tariff applicable for small hydro projects having capacity below 5MW.
Petitioner	:	CIAL Infrastructures Ltd
Petitioner represented by		Adv. Ashok Kumar.B, Council for the Petitioner Smt. MiniJoseph, CFO Shri. Jerin John, Assistant Manager, Electrical
Respondent	:	Kerala State Electricity Board Ltd (KSEB Ltd)
KSEB Ltd represented by	:	Shri.M.P.Rajan, DY CE, TRAC, KSEB Ltd Shri. Ajithkumar.K.N, EE, TRAC, KSEB Ltd
Date of hearing	:	23.11.2022, 11:00 AM
Venue	:	e-hearing through Video Conferencing

Order dated 08.03.2023

1. M/s CIAL Infrastructures Ltd (hereinafter referred as "CIAL INFRA" or petitioner) filed a petition on 07.10.2021 before the Commission with the following prayers:

   (1) Admit the present Petition.

   (2) Approve the Draft Power Purchase Agreement, with necessary modifications of clause 5.4, between the petitioner and KSEB for purchasing the entire energy generated from the project.

   (3) Determine the generic tariff notified by the commission as applicable for Small Hydro Electric projects having capacity below 5MW.

   (4) *Pass any such further order or orders as this Hon'ble Commission may deem just and proper in the facts and circumstances of the case*.

2. Summary of the petition filed by M/s CIAL Infrastructures Ltd is given below;

   (i) CIAL Infrastructures Ltd (**'CIAL INFRA'**) is a Company registered under the Companies Act, 2013, and is a wholly owned subsidiary of

Cochin International Airport Ltd. (CIAL). The parent company, CIAL was promoted by the Government of Kerala in 1994.

(ii) The State Government vide the Government Order GO (Ms) No. 23/2014/PD dated 21.07.2014 has allotted the 3MW Arippara SHP to M/s CIAL under CPP category.

(iii) Subsequently, as requested by CIAL, Government vide the Order GO (Rt) No. 266/2014/PD dated 24.10.2014, accorded sanction to change the name of the implementing agency to M/s CIAL Infrastructure Ltd. Further, in the same Order, State Government accorded sanction to change the project category from CPP to IPP category.

(iv) The petitioner M/s CIAL INFRA and the State Government signed an implementation agreement on 24.10.2014.

(v) As per the detailed Techno Economic Feasibility Report (TEFR), and also as recommended by the Technical Committee constituted by the State Government, the capacity of the project was enhanced from 3MW to 4.5MW.

(vi) Construction of the project was started in December 2015 and achieved CoD on 13.10.2021. The power evacuation arrangement upto 110kV substation of KSEB Ltd at Thambalamanna was also completed.

(vii) The petitioner signed the connection agreement with KSEB Ltd on 04.08.2021. KSEB Ltd provided physical connection on 05.08.2021 and the machines were synchronised on the same day with the grid. Joint meter readings were also recorded on 05.08.2021. Since then the entire electricity generated from the project is injected into the State Grid and KSEB Ltd has been utilising it.

(viii) KSEB Ltd already expressed their willingness to purchase the entire power from the project and a draft PPA was signed by KSEB Ltd with the petitioner on 17.01.2019. The Clause-5.4 of the PPA deals with the tariff, and which is extracted below.

“5.4 Tariff for power generated from the project shall be project specific tariff determined by the commission or generic tariff notified by the commission, whichever is lower”.

The petitioner ‘CIAL IFRA’ submitted that, since, the capacity of the project is below 5 MW, the applicable tariff may be Generic Tariff. The petitioner requested to modify the clause as “*the power generated from the project shall be generic tariff notified and determined by the Regulatory Commission”*.

(ix) Duly considering these aspects, the petitioner requested to approve the draft PPA as modified by the petitioner and also requested to approve the applicable generic tariff as the tariff for electricity generated from the project.

3. The Commission vide letter dated 15.11.2021, had communicated to the petitioner that, as per the decision of the meeting chaired by Hon'ble Chief Minister on 01.07.2017, the Commission has decided to determine the project specific tariff of the project and submit the following additional details to determine the project specific tariff.

(1) Detailed Project Report of the Arippara SHP (4.5MW) as recommended by the Technical committee constituted by the State Government and as approved by the State Government.
(2) Actual cost incurred for the project till the date of commissioning with all supporting documents including tax invoices.
(3) Actual funding of the project including Debt and Equity, with supporting documents.
(4) Certificate of the declaration of Commercial Operation
(5) Justification for cost and time overrun if any
(6) Subsidies, grants and other benefits availed, if any
(7) Any other relevant documents.

4. In compliance of the direction of the Commission, M/s CIAL Infrastructures Ltd, submitted the details on 20.12.2021. The summary of the details submitted by the petitioner is given below.

(i) **DPR of the project.**
The petitioner has produced a copy of the approved DPR, by the State Government. The cost estimate as per the DPR is given below;

Sl No	Particulars	As per DPR, Amount(Rs.Cr)	Rs. Cr/MW
1	Premium paid to GoK	0.81	0.18
2	Cost of land	1.7	0.38
3	Survey expenses, cost of DPR etc	0.08	0.02
4	Civil Works	12.01	2.67
5	Hydro Mechanical works	4.3	0.96
6	Electromechanical works	12.5	2.78
7	Interest during construction (IDC)	2.65	0.59
	Sub total	34.05	7.57
8	Power evacuation cost	1.2	0.27
	Total	35.25	7.83

(ii) Actual cost of completion
As per the details submitted by the petitioner, the total capital cost incurred/ claimed for the 4.5MW project is Rs 60.68 Cr, i.e, Rs 13.48

crore per MW. A comparison of the capital cost as per the DPR and actual is given below.

Sl No	Particulars	As per DPR		Actuals claimed		Increase in (%) over DPR cost
		Amount (Rs.Cr)	Rs (Cr/ MW)	Amount (Rs.Cr)	Rs (Cr/ MW)	
1	Premium paid to GoK	0.81	0.18	0.81	0.18	0.0%
2	Cost of land	1.70	0.38	4.12	0.92	140.9%
3	Survey expenses, cost of DPR etc	0.08	0.02	1.72	0.38	1811.1%
4	Civil Works	12.01	2.67	24.22	5.38	101.6%
5	Hydro Mechanical works	4.30	0.96	4.84	1.08	12.0%
6	Electromechanical works	12.50	2.78	16.66	3.70	33.2%
7	Interest during construction (IDC)	2.65	0.59	5.55	1.23	109.0%
8	Statutory approvals (connectivity charges, permits etc)			0.10	0.02	
	Sub total	34.05	7.57	58.02	12.89	70.3%
8	Power evacuation cost	1.20	0.27	2.68	0.59	118.5%
	Total	35.25	7.83	60.68	13.48	72.2%

(iii) Design Energy

The design energy as per the DPR is 14.717MU. The Capacity Utilisation Factor (CUF) corresponds to the design energy is 37.30%.

(iv) Source of fund.

Out of the total capital cost of Rs 60.681 crore, Rs 35.00 crore was met by loan availed from Federal Bank Ltd. **However, details of loans availed including the loan repayment period, moratorium if any, the interest rate etc were not submitted before the Commission.** The debt availed is 57.60% of the total capital cost of the project.

Equity. The equity amount incurred into the project is Rs 25.681 crore.

(v) COD

The date of CoD of the project is on 13.10.2021. Hence the financial year 2021-22, i.e., the financial year in which the project achieves the CoD is to be considered for tariff determination.

(vi) Subsidies and grants

The petitioner submitted that, they have not received any subsidies/grants from Central Government or State Government for the project.

5. KSEB Ltd vide the letter dated 27.08.2022 filed the counter affidavit and its summary is given below.

(A) Prayer for determining the generic tariff notified by the Commission as applicable for SHPs having capacity below 5MW.

(1) M/s KSEB Ltd submitted that the draft Power Purchase Agreement (PPA) was initialled with the M/s CIAL on 17/01/2019. The Clause 5.4 of the initialled PPA states that, ***"tariff for power generated from the project shall be project specific tariff as determined by the commission or generic tariff notified by the Commission, whichever is lower."***

(2) As per Regulation 35(1) of KSERC (Renewable Energy and Net Metering) Regulation 2020, the generic tariff determined by the Commission shall be the upper ceiling limit and shall not prevent the generator and distribution licensee from agreeing to a lower tariff than the generic tariff determined by the Commission. It is also specified therein that, the generic tariff so determined by the Commission shall not prevent the right of the generator to get a project specific tariff determined, if they so desire, by the Commission as per the provisions of these regulation.

(3) Renewable Energy and Net metering regulation 2020, specifics the generic tariff for the financial year 2019-20. The Arippara SHEP achieved CoD during the financial year 2021-22, for which generic tariff has not been determined by the Commission.

(B) Prayer to Approve the Draft Power Purchase Agreement, with necessary modifications of clause 5.4, initialled between the petitioner and KSEB for purchasing the entire energy generated from the project

(4) KSEB Ltd submitted that, they are responsible to procure power at lowest rate for the benefit of the consumers of the State. The Arippara SHEP (2x2.25 MW) being a run-of the river project, the power is completely infirm in nature. The electricity is generated from the project is mainly during monsoon season, when the electricity demand is low. There is no power is available from the project during summer months.

(5) KSEB Ltd will have to back down conventional sources and surrender the contracted power to accommodate the generation from the must run SHPs.

(6) KSEB Ltd further submitted that as per the Discussion paper published by ministry of Power on "*One Nation One Tariff*" for *RE Power , an initiative for Uniform RE Tariff for Discoms* as well as the uniform tariff concept included in the Draft Electricity

(Amendment) Rules, 2022 notified by ministry of power dated 12.08.2022, it *is clear that rates from renewable energy sources especially wind will significantly reduce in the future which will* help in achieving non-solar RPO at a lower cost.

In these circumstances, procuring power at higher rates during low demand monsoon seasons by surrendering the available capacity will create financial burden on the consumers of KSEB Ltd.

(7) M/s KSEB Ltd further submitted that in this scenario, it is only viable for KSEB Ltd to procure this power at a rate comparable with the average pooled power purchase cost for the FY 2021-22 which is Rs.3.22/unit.

(8) KSEB Ltd also submitted that, the State Government while allotting the project it is clearly specified that IPP shall be more beneficial to the State than CPP. Hence the power purchase from Arippara SHP at higher rate will be contradictory to the condition laid down by the State Government.

(9) KSEB Ltd also submitted that, purchase of power from Arippara SHP at higher rate will result in increase of the Average Pooled Power Purchase Cost (APPC) and settlement of surplus energy banked by the prosumers at APPC will increase the cost of settlement and increase the financial burden of all consumers.

(10) Considering the above aspects, KSEB Ltd requested to relook in to the Clause 5.4 of the initialed PPA to match with the present market trends of RE. KSEB Ltd further submitted that, they are desirous to purchase the power generated from the project at a tariff which is lowest among the generic tariff, project specific tariff or APPC in which the CoD of the project is approved.

(11) Furthermore, M/s KSEB Ltd has given a letter of comfort to M/s Suiso Energy Private Limited for the procurement of power from Ezhamkadavu mini HEP (350 KW) and also to M/s Mukkudam Electro Energy Private limited for procurement of power from Mukkudam SHEP (4 MW) with the condition that the tariff from the project is lower of the project specific tariff determined by KSERC or the average pooled power purchase cost of KSEB Ltd for the year in which the CoD of the project is approved or mutually agreed.

(12) It was submitted that, due to the aforementioned difficulties faced by KSEB Ltd, the clause 5.4 of the initialled PPA need to be relooked to match with present market trends of RE.

(13) M/s KSEB Ltd further submitted that it is desirous to purchase power generated from the project at a tariff which is lowest among the generic tariff or project specific tariff determined by the Commission or the APPC of KSEB Ltd in which the CoD of the project is approved.

6. The hearing on the petition was conducted on 23.11.2022. Adv. Ashok Kumar.B and Smt. MiniJoseph, CFO presented the petition on behalf of CIAL and answered to the queries raised by the Commission. Shri. Ajithkumar.K.N, EE presented the counter arguments on behalf of the respondent KSEB Ltd. The summary of the deliberations during the hearing is given below;

(1) The Petitioner, M/s CIAL Infrastructures Limited submitted the following during the hearing.

(i) Arippara SHEP of 4.5 MW was synchronized with the grid on 05-08-2021 and the COD of the project declared on 13-10-2021.

(ii) As per the Regulation 35 of the KSERC (Renewable Energy and Net Metering) Regulations 2020, generic tariff determined by the Commission shall be applicable to the renewable energy projects which declares commercial operation (COD) during that financial year. It is also specified therein that, the generic tariff determined by the Commission for a financial year shall be applicable provisionally to the renewable energy projects which are commissioned after the close of that financial year, till such time, the tariff is revised by the Commission.

(iii) Since the COD of the project was declared on 13th October 2021, the generic tariff applicable for the SHEP, with the benefit of accelerated depreciation shall be Rs. 5.53 per unit.

(iv) The total capital cost incurred for the Arippara SHP is Rs. 60.68 crores and the cost per MW is Rs. 13.48 crores.

(v) As per the Regulations notified by the Commission, the useful life of SHP is 35 years for the determination of tariff, whereas, the power department has allotted this project to CIAL for a BOOT period of only 30 years, including the construction period. As the Implementation Agreement with power department was signed only on 24-10- 2014, the remaining BOOT period is only 23 years and hence the life of the SHEP plant may be adopted as 23 years for tariff determination.

(vi) The construction and commissioning of the project was delayed due to the protest of local people, court direction to use chemical blasting, unprecedented floods and landslides in 2018 and 2019 and extended lockdown due to covid-19 pandemic.

(vii) It was further submitted that from the date of synchronization till 31-10-2022, CIAL Infra had supplied 1,82,82,800 units of energy, generated and injected into KSEBL grid for which they have not received any payment from KSEBL for want of approved tariff and PPA. Moreover, the project has become operational and has been capitalized in their book of account as on 13-10-2021, for a value of Rs. 60.68 crores, but no revenue has been accounted till date, for the generation of electricity from this project.

(viii) There is a big strain on their cash flow because of Arippara SHEP project, as the principal repayment of the term loan of Rs. 35 crores taken for execution of this project, has started and till 31-10-2022, they have repaid Rs. 8.5 crores towards principal and Rs.7.3 crores towards interest. Apart from principal repayment and its interest, they have to meet the daily running expenses of the project like operation & maintenance charges, security charges, insurance expenses, repairs & maintenance, cost of consumables etc. which is causing a huge blow to their cash flow mechanism. Hence, it was requested to grant an “interim tariff” of Rs. 4 per unit, for the electricity generated and supplied to KSEBL from Arippara SHEP (4.5 MW), till a final order is passed on this petition and also to direct KSEBL to make provisional payments against this interim billing. It was also requested to fix the tariff of Rs. 5.53 per unit for the sale of power generated from Arippara SHEP, which is the generic tariff applicable for small hydro projects having capacity below 5 MW as per KSERC (Renewable Energy and Net Metering) Regulations 2020. The petitioner also requested to approve the PPA to be entered into with KSEBL.

(2) Respondent KSEB Ltd submitted the following during the hearing;

(i) As per the initialed PPA, KSEBL is desirous to purchase all the energy generated from the project and the developer is willing to sell the same to KSEBL on mutually agreed terms and conditions. The terms and conditions of the PPA are as per prevailing KSERC regulations. The clause 5.4 of PPA states that, the tariff for power generated from the project shall be project specific tariff as determined by the Commission or generic tariff notified by the Commission, whichever is lower.

(ii) As per the Regulation 35(1) of the Renewable Energy and Net Metering Regulations, 2020, the generic tariff determined by the Commission shall be the upper ceiling and it shall not prevent the generator and distribution licensee from agreeing for a lower tariff.

(iii) The Arippara SHEP achieved CoD during the financial year 2021-22, for which generic tariff has not been determined by the commission.

(iv) KSEB Ltd submitted that, it is responsible to procure power at lowest rate for the benefit to the consumers of the state. Arippara SHEP is a run-of -the river project, generating power mainly during monsoon season. Hence the energy generated is completely infirm in nature.

(v) KSEB Ltd, further submitted that in earlier days, KSEBL has entered into contracts with run-of-the-river projects for meeting mandatory RPO and as per the policies of the State Governmnet. KSEB Ltd had initialed the PPA with M/s. CIAL Infrastructures Ltd in 2019 was also to achieve the above objectives and policies. However, in the RE sector, the price of RE has drastically come down in solar and non-solar sectors. In order to utilize the benefit of lower RE price, KSEBL has taken action for entering into cheaper RE contracts for meeting its RPO targets of both Solar and non-solar sources. The benefit of which is ultimately passed on to the consumer of the state.

(vi) The main reasons submitted by the petitioner for the cost overrun was due to non-political events . As per clause 7.6 of the Implementation Agreement, no party will be liable in any manner to other party on any loss, damage, cost, expense, claims, demands and proceedings relating to occurrence of any Force Majeure event.

(vii) The Debt: Equity ratio claimed by the developer is 57.7:42.3. As per the Regulation 40 of the RE regulation 2020 ‘For all renewable energy projects, the debt-equity ratio shall be 70:30 of the capital cost as approved by the Commission as on the date of commercial operation shall be considered for tariff determination.

(viii) It was further submitted that the construction work commenced in Dec 2015, the central financial assistance of Rs. 3.5 Cr/ MW available for SHP scheme was in force up to 31.03.2017 and further extended to 30.09.2017. The grant would have been received if the petitioner had applied on time. However, the petitioner had not availed the CFA provided by the Central Government.

(ix) KSEB Ltd further submitted that the project specific tariff or Generic tariff may be determined with the benefit of accelerated depreciation as per the Regulation. The petitioner has not mentioned about CDM benefits. Such factor also to be considered while determining the tariff.

(3) The Commission during the hearing pointed out that, as per the records and details presented by the petitioner CIAL INFRA and the respondent KSEB Ltd, the licensee KSEBL Ltd has already communicated its willingness to purchase the entire electricity generated from the project at the tariff and terms and conditions approved by this Commission. The project was already achieved COD on 13.10.2021 and the electricity has been generating since then and supplying to KSEB Ltd. Hence the licensee, which is a Sate Government owned company cannot be backdown from the commitment already given.

7. KSEB Ltd vide additional submission dated 05.12.2022 submitted the following;

(1) Tariff determination and approval of PPA are two distinct and separate issues, the Commission may approve the tariff and PPA through separate proceedings. The Commission observed the same in the hearing for the determination of tariff for Anakkampoil 8 MW in OP No.01/2021.

(2) The Capital Cost claimed by the petitioner is much higher than Capital Cost as per the DPR approved by the State Government. The Capital cost of Arippara SHEP as per DPR including IDC is Rs 3525 Lakhs whereas the actual capital cost claimed including IDC is Rs 6068 Lakhs which is 72% more than DPR cost approved by the State Government.

(3) The Commission may direct the petitioner to produce all the Orders issued by the State Government, who is the sanctioning authority for the project for claiming additional capital cost incurred, which was not in original scope of work in TEFR and DPR approved by the Government.

(4) The Petitioner vide letter no. CIL/Fin/2021-22/452 dated 20.12.2021 stated that, the main causes for cost overrun are increase in contract rates due to delay caused by the protest of local people, unprecedented floods in 2018 & 2019 and additional protection works due to floods and landslides. Such events are classified as non-political events as per Implementation Agreement (IA). The obligations of the parties in the event of force majeure are mentioned in Clause 7.4 of IA. No such information was provided by the petitioner in the petition.

(5) The Debt, Equity ratio claimed by the petitioner is 57.7:42.3, which is not as per the Regulation 40 of KSERC (Renewable Energy and Net Metering) Regulations 2020. Hence the Commission may limit the equity portion as per the prevailing regulation.

(6) Petitioner has the facility to claim accelerated depreciation and CDM (Clean Development Mechanism). But no such information has been provided by the petitioner.

(7) Hence the Commission may consider these factors and the project specific tariff or Generic tariff may be determined with the benefits of accelerated depreciation and CDM, as per the regulation, for the benefit of consumers of the state.

Analysis and Decision

8. The Commission, as per the provisions of the Electricity Act 2003, and other relevant Regulations notified it, has examined in detail the petition filed by M/s CIAL Infrastructures Ltd, the counter affidavit filed by the respondent KSEB Ltd, deliberations during the hearing, and other documents and records, and decided as follows.

9. The relevant details and background of the project is summarized below;

(1) M/s CIAL Infrastructures Ltd (**'CIAL INFRA'**) is a Company registered under the Companies Act, 2013, and is a wholly owned subsidiary of Cochin International Airport Ltd. (CIAL).

(2) KSEB Ltd is the incumbent distribution licensee of the State, which is fully owned by the State Government.

(3) The M/s CIAL Infra has developed 4.5MW Arippara SHP at the Iruvanchipuzha, a tributary of Chaliar basin. The project was allotted by the State Government as per the Kerala Small Hydro Policy 2012, and based on the competitive bidding route, vide the GO (Ms) No. 23/2014/PD dated 21.07.2014 and Go(Rt) No.266/2014/PD dated 24.10.2014.

(4) An Implementation Agreement (IA) was also signed between the M/s CIAL INFRA and the State Government on 24.10.2014. As per the Article-2 of the IA, the Build Own Operate & Transfer (BOOT) period of the project was valid for a period of 30 years from the date of allotment, i.e. 30 years from 20.07.2014.

(5) The paragraph 12 of the Kerala Small Hydro Policy, 2012 provides the procedure for the sale of power generated from the SHPs allotted by the State Government through bidding route to the private developers, which is extracted below.

"12. Sale of power generated by Small Hydro Power Projects;

12.1 The State Transmission Utility / Kerala State Electricity Board shall have the first right of purchase the power generated by IPPs and surplus of power from CPPs at a tariff and other terms and conditions set forth by the Kerala State Electricity Regulatory Commission.

12.2 If KSEB or it successor entity is not intending to purchase the power, Kerala State Electricity Regulatory Commission will permit non-discriminatory open access within the State of Kerala to sell the power to any entity within Kerala. Kerala State Electricity Regulatory Commission may permit open access for sale of power outside Kerala duly complying with the Section 11 of EA 2003.

12.3 For open access, the Rules framed by KSERC shall be applicable."

(6) KSEB Ltd communicated its willingness to purchase power from the project and also initialed the draft Power Purchase Agreement on 17th January 2019. The Clause 5.4 of the initialed PPA provide as follows;

"tariff for power generated from the project shall be project specific tariff as determined by the commission or generic tariff notified by the commission whichever is lower."

(7) The Arippara SHP was declared CoD on 13.10.2021. Since then power is generated and supplied to KSEB Ltd. Since the tariff for the electricity generated from the project is yet to be approved by this Commission, no payment was effected to the developer till date.

10. The petitioner M/s CIAL Infra filed the present petition with the prayers to;

(1) *Approve the Draft Power Purchase Agreement, with necessary modifications of clause 5.4, between the petitioner and KSEB for purchasing the entire energy generated from the project.*

(2) Determine the generic tariff notified by the commission as applicable for Small Hydro Electric projects having capacity below 5MW.

11. The Commission examined the prayers of the petitioner in detail. The tariff determination as per the Section 62 of the EA-2003 and the approval of the Power Purchase Agreement as per Section 86(1)(b) of the EA-2003 are two distinct functions of the Commission. The tariff determination involves detailed appraisal of the project and it is a time consuming process. Hence the Commission has decided to limit the scope of the present petition to the determination of the project specific tariff of the electricity generated from the project. **Once the Commission determine the tariff, the petitioner shall initial the PPA with KSEB Ltd at the approved tariff and mutually agreed terms and conditions, and submit the same before this Commission for approval as per the Section 86(1)(b) of the EA-2003**.

12. The Commission vide the letter dated 15.11.2021 had communicated its decision to determine the project specific tariff of the project and directed the petitioner to submit the necessary details for the same. The petitioner had

submitted the same on 20.12.2021. There was delay from the part of the respondent to submit the counter affidavit, which was filed only on 27.08.2022. The hearing on the petition was held through video conference on 23.11.2022. The Commission has allowed 10 days time to submit the additional comments. In compliance of the direction of the Commission, KSEB Ltd has submitted the additional details on 05.12.2022, however the petitioner CIAL Infra has submitted the additional details only on 27.02.2023.

The Commission has determined the project specific tariff of the project with the available details submitted by the petitioner and also the counter affidavit of the respondent KSEB Ltd. The details are given in the following paragraphs.

Applicable Regulations for determination of project specific tariff

13. The petitioner CIAL INFRA, with the recommendation of the respondent KSEB Ltd has declared commercial operation of the project on 13.10.2021. Hence the relevant year for tariff determination is the FY 2021-22, the year in which the projected achieved CoD.

14. The Commission on 7th February 2020 has notified the KSERC (Renewable Energy and Net Metering) Regulations, 2020 (herein after referred as RE Regulations, 2020) , and it was published in the official Gazette on 5th June 2020. As per the Regulation 33 of the said Regulation, it is applicable for the for five years from 2019-20, i.e., upto 2023-24.

15. The Chapter-IV of the RE Regulations 2020 deals with the technical and financial norms and other aspects and procedures for the determination of tariff. The second and third proviso to RE Regulations, 2020 specifies that, this Commission while formulating and notifying the principles and norms and parameters for determination of tariff of the RE projects was guided by the principles, norms and parameters specified by the Central Commission for the determination of tariff of the electricity generated from the Renewable Energy Projects.

It is also specified in the RE Regulations 2020 that, until separate norms and parameters are specified by this Commission for the purpose of determination of tariff, the principles norms and parameters specified in the CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2017, as amended from time to time. The relevant Regulations is extracted below.

" 32. Norms for determination of tariff.-

…….

*Provided further that, the Commission, while formulating and notifying the principles, norms and parameters for determination of tariff for the renewable energy from various categories of renewable source of energy, is guided by the National Electricity Policy and Tariff Policy published under Section 3 of the Act and t**he***

principles, norms and parameters specified by the Central Commission for this purpose.

Provided also that, until separate principles, norms and parameters are specified by the Commission for the control period, the principles, norms and parameters specified by the Central Commission for the purpose of determination of tariff for the electricity generated from various categories of renewable sources of energy, ***as specified in the Central Electricity Regulatory Commission (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2017, as amended from time to time, shall be adopted by the Commission for the purpose of determination of tariff under these Regulations."***

16. The Commission has formulated the technical and financial norms specified in the RE Regulations, 2020 based on the principles, norms and parameters specified by the Central Commission in the CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2017 (herein after referred to as CERC RE Regulations, 2017). The said CERC Regulations was applicable from 01.04.2017 to 31.03.2020 only.

Subsequently, the Central Commission vide the notification dated 23rd June 2020 has notified the CERC (Terms and Conditions for Tariff Determination from Renewable Energy Sources) Regulations, 2020 (herein after referred to as CERC RE Regulations, 2020).

The Commission noticed that, there is considerable change in the norms and parameters for tariff determination specified in the CERC RE Regulations, 2020 compared to the CERC RE Regulations, 2017. Hence there is difference in the norms and parameters for tariff determination of electricity generated from the RE sources specified by this Commission in the RE Regulations, 2020 and the same in the CERC Regulations, 2020.

As per the Section 61(a) of the EA-2003, while specifying the terms and conditions for determination of tariff, the State Commissions shall be guided by the 'principles and methodologies specified by the Central Commission for determination of the tariff applicable to generating companies, and transmission licensees'.

Considering the above reasons, this Commission has decided to adopt the norms and parameters specified by the Central Commission as specified in the CERC RE Regulations, 2020 for the determination of tariff of the electricity generated from the RE projects, until this Commission amend/modify the norms and parameters in the KSERC RE Regulations, 2020 in line with the CERC RE Regulations, 2020.

Determination of the project specific tariff of the Arippara 4.5 MW SHP developed by M/s CIAL Infrastructures Ltd.

17. The following technical and financial parameters have been considered for determination of the tariff for the electricity generated from the Arippara 4.5 MW SHP .

1. Capital cost
2. Useful life of the plant
3. Plant load factor
4. Auxiliary consumption
5. Debt: Equity ratio
6. Term of loan and interest
7. Return on Equity
8. Interest on working capital
9. Depreciation
10. Operation and Maintenance expenses
11. Discount rate

Capital cost

18. Petitioner had produced a copy of the detailed project including the detailed cost estimate of the project, loan sanctioned by Federal bank and the actual cost claimed for the project. A comparison of the capital cost as per the DPR, and the claim of the petitioner is given below.

Sl No	Particulars	As per DPR		Claimed by the petitioner	
		(Rs. Cr)	(Rs. Cr/ MW)	(Rs. Cr)	(Rs. Cr/ MW)
1	Premium paid to GoK	0.81	0.18	0.81	0.18
2	Connectivity charges paid to KSEBL		0.00	0.01	0.00
3	Cost of land	1.70	0.38	4.12	0.92
4	Survey expenses, cost of DPR etc	0.08	0.02	1.72	0.38
5	Civil Works	12.01	2.67	24.22	5.38
6	Hydro Mechanical works	4.30	0.96	4.84	1.08
7	Electromechanical works	12.50	2.78	16.66	3.70
8	Statutory approvals and permits		0.00	0.09	0.02
9	Interest during construction (IDC)	2.65	0.59	5.55	1.23
	Sub total	34.05	7.57	58.01	12.89
10	Power evacuation cost	1.20	0.27	2.68	0.60
	Total	35.25	7.83	60.68	13.48

19. The actual capital cost claimed by the petitioner is Rs 13.48 crore per MW against Rs7.83 crore per MW estimated in the DPR. Brief description of the capital cost claimed by the petitioner under various heads are discussed below.

(1) **<u>Cost of land including the cost for developing the land.</u>**

The petitioner claimed that, they had purchased 3.2 hectares of land vide 31 sale deeds, and spent Rs 4.12 crore for purchasing the same.

(2) **Cost of Civil works**

As per the documents submitted by the petitioner, the civil works of the project was awarded to M/s Antech Construction Company at a total cost of Rs 22.38 crore and M/s Bethlahem Constructions at a total cost of 10.02 Crores. The petitioner also claimed Rs 81.01 lakh towards the cost of Miscellaneous civil works.

(3) **Cost of electro mechanical works.**

The petitioner had entered into agreement with the contractor M/s Mecamidi HPP India Pvt Ltd for a total cost of Rs 16.64 crore including taxes. As per the agreement, the taxes shall be paid extra.

The petitioner also claimed Rs 1.29 lakh towards the cost of Miscellaneous Electro Mechanical Works.

(4) **Cost of hydro -mechanical works**

The petitioner had entered into agreement with the contractors M/s GMW Pvt Ltd for a total cost of Rs 1.16 crore including taxes and M/s Encon Fabricators and Erectors Pvt Ltd for a total cost of Rs 3.63 Crores.

(5) **Power Evacuation cost and Statutory permit, approval costs**

The petitioner claimed that, they had incurred Rs 2.68 crore towards the Power evacuation, which includes a cost of 0.08 Crores towards supply and laying of 33 kV HT cables as well as an amount of Rs 1.6 crores towards the Evacuation cost.

The petitioner further claimed that they had incurred Rs 8.80 lakhs towards the expense for the Statutary approvals and permits

(6) **Connectivity Charges, Project Management expenses including IDC**

The amount claimed under these heads include the following.

Sl No	Particulars	Claimed by the petitioner
1	Premium paid to GoK	0.81
2	Connectivity charges paid to KSEBL	0.01
3	Survey expenses, cost of DPR etc	1.72
4	Interest during construction (IDC)	5.55
	Total	8.09

As per the Kerala Small Hydro Policy 2012, the minimum threshold limit of premium to be payble to the GoK is fixed as Rs 15.00 lakh per MW. The excess amount quoted by the bidder above the thresh hold limit of premium quoted shall be borne by the successful bidder and such excess amount cannot be passed on to the consumers through tariff.

20. As above, the petitioner has claimed Rs 60.68 crore towards capital cost of the project @Rs 13.48 crore/MW, as against Rs 7.83 crore/MW in the approved DPR. The capital cost claimed by the petitioner is 72% higher than the amount as per the approved DPR. The petitioner could not submit proper justification for such excessive increase in capital cost. Hence the Commission could not admit such expenses for the determination of tariff.

21. As explained in paragraph-16 above, the Commission has decided to adopt the norms and parameters as specified in the CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) Regulations, 2020 (hereinafter referred to as CERC RE Regulations, 2020), for determining the project specific tariff of the electricity generated from the 4.5MW Arippara SHP.

As per the Regulation 27 of the CERC RE Regulations, 2020, the normative capital cost for small hydro projects having capacity below 5 MW is Rs 7.80 crore per MW. This is the ceiling on capital cost specified for small hydro projects having capacity less than 5 MW. Accordingly, the Commission constrained to adopt Rs 7.80 crore per MW for the determination of the tariff of the 4.5MW Arippara SHP.

22. However, as per the Regulation 12 of the CERC RE Regulations, 2020, the normative capital cost specified in the CERC Regulations includes the cost of evacuation infrastructure upto the interconnection point. Further, as per the Regulation 2(1)(o) of the CERC RE Regulations,2020, the interconnection point for small hydro projects is the line isolator on outgoing feeder HV side of generator transformer.

Considering the above, the Commission has decided to admit the following cost of evacuation infrastructure claimed by the petitioner from the HV side of the generator transformer also in addition to the normative capital cost claimed by the petitioner.

Cost of evacuation infrastructure claimed

Sl No	Particulars	Amount (Rs. Cr)
1	Cost of cable & Cable laying charges from Arippara to Common pooling substation (2.5 km long)	0.805
2	Deposit works paid to KSEB Ltd	1.620
3	Fees paid to Panchayat and PWD for road cutting permit for cable laying	0.035
4	Charges for testing, commissioning and other technical services	0.113
5	Advance amount paid for cost of land for common pooling substation	0.103
	Total	2.676

M/s CIAL Infra vide the letter dated 27th February 2023 has claimed that, since the submission of the project cost details vide the letter dated 20.12.2021, the petitioner had incurred an additional amount of Rs 1.1495 crore on account of power evacuation. Out of this claim, Rs 1.106 crore is the amount shared with the other developers Anakampoil SHP and Pathamkayam SHP. The petitioner could not submit the details and justification and rationale for such sharing of expenses with the developers Anakampoil SHP and Pathamkayam SHP. Hence the Commission hereby rejects such claim of M/s CIAL Infra as part of the cost of evacuation infrastructure.

Based on the above, the capital cost admitted for the determination of the project specific tariff is detailed below.

Capital cost approved for tariff determination

Sl No	Particulars	As per DPR		Claimed by the petitioner		Approved by the Commission (Rs.Cr)	
		(Rs. Cr)	(Rs. Cr/ MW)	(Rs. Cr)	(Rs. Cr/ MW)	(Rs.Cr)	(Rs. Cr/MW)
1	Premium paid to GoK	0.81	0.18	0.81	0.18		
2	Connectivity charges paid to KSEBL		0.00	0.01	0.00		
3	Cost of land	1.70	0.38	4.12	0.92		
4	Survey expenses, cost of DPR etc	0.08	0.02	1.72	0.38		
5	Civil Works	12.01	2.67	24.22	5.38		
6	Hydro Mechanical works	4.30	0.96	4.84	1.08	Rs 35.10 crore @Rs 7.80 crore/MW)	8.39
7	Electromechanical works	12.50	2.78	16.66	3.70		
8	Statutory approvals and permits		0.00	0.09	0.02		
9	Interest during construction (IDC)	2.65	0.59	5.55	1.23		
	Sub total	34.05	7.57	58.01	12.89		
10	Power evacuation cost	1.20	0.27	2.68	0.60	2.68	
	Total	35.25	7.83	60.68	13.48	37.78	

Useful life of the project

23. As per the Regulation 2(1)(hh) of the CERC RE Regulations, 2020, useful life of Small Hydro Project is specified as 40 years.

However, the petitioner during the hearing submitted that, the State Government vide the Order dated GO (Ms) No. 23/2014/PD dated 21.07.2014 has allotted the project to the petitioner for implementation on BOOT basis for 30 years from the date of execution of Implementation Agreement with the State Government.

The petitioner has signed the Implementation Agreement with the State Government on 24.10.2014. As per the Clause 2.1 of the Implementation Agreement, the Agreement is valid for a period of 30 years from the date of allotment including the construction period.

As per the GO dated 21.07.2014, the BOOT period of the project is only upto 23.10.2044 only and thereafter the terms may be extended by both the parties on mutually agreed terms, otherwise the project has to be transferred to the Government or KSEB Ltd/its successors on being authorized by the Government at free of cost.

The project achieved the CoD on 13.10.2021. Thus effectively, about 23 years and 10 days only available to the petitioner to recover the entire cost of the project.

Considering these reasons, the Commission has adopted the useful life of the project as 23 years (rounded off) on the presumption that the project shall be handed over to the State Government/ KSEB Ltd after the BOOT period. In the event the petitioner and Government/KSEB Ltd decided to extent the agreement for a further period, it can be done only on mutually agreed terms and prior approval of such terms from this Commission, and also duly considering the fact that the entire cost recovery is ensured during the BOOT period.

Capacity Utilisation Factor (CUF)

24. The petitioner has submitted a copy of the detailed project report (DPR) of the Arippara 4.5 MW project, which was approved by the State Government. As per the Table 13.7 of the DPR, the design energy at the bus bar is determined at 14.717 MU for the 4.5MW plant.

Accordingly, based on the approved DPR, the Commission has adopted the design energy as 14.717 MU. The CUF of the project at the design energy of 14.717 MU is 37.33%, which is adopted for the determination of project specific tariff.

Auxiliary Consumption

25. As per the Regulation 29 of the CERC RE Regulations, 2020, the auxiliary consumption of small hydro projects shall be considered as 1%. Hence the Commission adopts the auxiliary consumption of the Arippara 4.5 MW project as 1% of the design energy for the determination of tariff.

Debt: Equity Ratio

26. As per the Regulation 13 of the CERC RE Regulations, 2020, the normative Debt: Equity ratio is 70:30. The Commission decided to adopt the same for the determination of the project specific tariff of Arippara 4.5MW SHP.

Loan repayment period

27. The petitioner has claimed to have availed a term loan of Rs 35.00 crore for the project. However the details of the loan including the interest rate, loan repayment period etc were not submitted along with the petition. Hence the

Commission has decided to adopt the loan tenure as 15 years as per the Regulation 14(1) of the CERC RE Regulations, 2020.

Interest of loan

28. As per the Regulation 14(2) of the CERC RE Regulations, 2020, the interest rate to be adopted for tariff determination is ‘two hundred (200) basis points above the average SBI Marginal Cost of Funds based Lending Rate (MCLR) (one year tenor) prevalent during the last available six months’.

As detailed in the previous paragraphs, the CoD of the project was on 13.10.2021. The average MCLR (one year tenor) for the past six months from the month of CoD, i.e., from October-2021 is 7.00%. Accordingly, the Commission decides to adopt the normative interest rate for the determination of tariff at 9.00%.

Depreciation

29. The Commission, as per the Regulation 15 of the CERC RE Regulation, 2020, has decided to adopt depreciation @4.67% for the first 15 years and depreciation for the balance BOOT period of 8 years (23 years-15 years) @ 2.49% for the determination of the tariff.

Components of working capital

30. As per the Regulation 17 of the CERC RE Regulations 2020, the components of the working capital consists of the following:
(i) O&M cost for one month,
(ii) Maintenance of spares at 15% of the O&M cost,
(iii) Receivable for 45 days of tariff for sale of electricity calculated on the normative CUF.

Interest on working capital

31. As per the Regulation 17(4) of the CERC RE Regulation 2020, the 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 MCLR (One Year Tenor) prevalent during the last available six months.

The CoD of the Arippara SHP is in the month of October 2021. The average SBI MCLR rate for past six months from October 2021 is 7.0%. Accordingly, as per the CERC RE Regulation, 2020, the Commission decides to adopt the interest rate for computing interest on working capital at 10.50% for determination of tariff.

Operation and Maintenance Expenses

32. As per the Regulation 30 of the CERC RE Regulations, 2020 the O&M cost for SHEP of capacity of and below 5MW is 33.66 Lakh/MW. The Commission decided to adopt the same.

Further, as per the Regulations 19(2) of the CERC RE Regulations, 2020, the escalation on the O&M cost is 3.84% per annum.

Return on equity

33. As per the Regulations 16 of the CERC RE Regulations, 2020, the normative RoE specified is 14%. The Commission decides to provide RoE @14% on 30% of the capital cost adopted for tariff determination.

The Commission has been taking the consistent stand that, Income Tax/ Minimum Alternative Tax (MAT) on RoE if any, paid by the generator, shall be reimbursed separately by the distribution licensee on production of documentary evidence of remittance, annually for the entire useful life of the project. Hence, any tax paid on the RoE shall be allowed as a pass through, limited to the amount of equity considered in this Order, which shall be claimed separately from KSEB Ltd, duly furnishing proof of payment of such tax.

Discount factor for computing levelised tariff

34. As per the Regulation 10 of the Central Electricity Regulatory Commission (Terms and Conditions forTariff determination from Renewable Energy Sources) Regulations, 2020, for the purpose of levelised tariff computation, the discount factor equivalent to Post Tax Weighted Average Cost of Capital(WACC) shall be considered.

The interest rate considered for loan component is 9.0% and the RoE allowed is 14%. Since the Commission has decided to reimburse the income Tax/ Minimum Alternative Tax (MAT) on RoE if any, paid by the generator, shall be reimbursed separately by the distribution licensee on production of documentary evidence of remittance annually for the entire useful life of the project, the Commission has not considered the tax payable for estimating the discount rate.

Accordingly, the WACC has been computed as under:

WACC = Cost of Debt + Cost of Equity

Where

Cost of Debt = 70% x interest rate
= 70% x 9.0% = 6.30%

Cost of equity = 30% x return on equity= 30%x14%
= 4.20%

Accordingly, the Commission, arrive the discount factor for determining the levelised tariff as follows.

Particulars	WACC
Cost of debt	
0.7 * 9.00%	6.30%
Cost of Equity	
0.3 * 14%	4.20%
Weighted Average cost of capital	**10.50%**

Summary of the technical and financial parameters

35. The summary of the technical and financial parameters adopted for determining the tariff of the 4.5 MW SHEP developed by M/s CIAL Infrastructures Ltd at Arippara, Kozhikode is given below.

Sl No	Particulars			Remarks
1	Installed capacity	4.5	MW	As per the petition
2	Life of the plant from CoD for tariff determination	23	Years	As per the Implementation Agreement
3	Capacity utilisation factor	37.23	%	As per the DPR
4	Auxiliary consumption	1%		CERC RE Regulation 2020
4	Capital cost of the project	8.39	Rs .Cr/MW	Approved after prudence check
5	Debt: Equity	70:30		CERC RE Regulation 2020
6	Loan tenure	15	Years	
7	Interest rate (MCLR rate+ 2%) (MCLR- last six months- 7.0%)	9.0	%	
8	RoE (post-tax)	14.0	%	
9	MAT/ Income tax	Pass through at actual		
10	Working capital			
	(i) O&M cost for one month			CERC RE Regulation 2020
	(ii) Receivable equivalent to 45 days			
	(iii) Maintenance of spares @15% of the O&M expenses			
11	Interest on WC (MCLR+3.50%)	10.5	%	
12	O&M cost (first year)	34.95	Rs Lakh/ MW/ year	CERC RE Regulation 2020
13	Essacaltion for O&M cost for subsequent years	3.84%	Annually	
14	Depreciation	4.67%	for first 15 years	CERC RE Regulation 2020
		2.49%	For remaining useful life	
15	Discount rate = weighted average cost of capital	10.50	%	

Based on the above norms and parameters, the levelised tariff determined for the 4.5MW Arippara small Hydro Project for the useful life of the project at Rs 4.63/unit.

<u>Subsidy or incentive by the Central / State Government</u>

36. The Regulation 22 of the CERC RE Regulations, 2020 specifies that, the Commission shall take into consideration any incentive or subsidy offered by the Central / State Government including accelerated depreciation. The relevant regulation is extracted below.

"22.Subsidy or Incentive by the Central / State Government.-

(2) The Commission shall take into consideration any incentive, grant or

subsidy from the Central or State Government, including accelerated depreciation benefit, availed by the project, while determining the tariff under these regulations:

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

i) Assessment of benefit shall be based on normative capital cost, accelerated depreciation rate and corporate income tax rate as per relevant provisions of Income Tax Act, 1961 as amended from time to time; and

ii) Capitalization of renewable energy projects during second half of the fiscal year.

iii) Per unit benefit shall be derived on levelized basis at discount factor equivalent to weighted average cost of capital.

(2) Any grant, subsidy or incentives availed by renewable energy project, which is not considered at time of determination of tariff, shall be deducted by the beneficiary in subsequent bills after receipt of such grant, subsidy or incentive in suitable instalments or within such period as may be stipulated by the Commission.

(3) In case the Central or State Government or their agencies provide any generation based incentive, which is specifically over and above the tariff, such incentive shall neither be taken into account while determining the tariff nor be deducted by the beneficiary in subsequent bills raised by the particular Renewable energy project."

The Commission has noted that the provisions of Accelerated Depreciation are available in the Income Tax Act 1961 and Rules framed there under. A person who qualifies under the above statutory provisions is entitled to get benefit of Accelerated Depreciation. Moreover, that Income Tax Act would not make any discrimination between the tax payers / investors, everyone is allowed to avail the benefit as per provisions under Income Tax Act. Under Cost plus approach the tariff is determined upon normative cost and performance parameters. In view of the fact that the Commission has allowed all reasonable cost and returns to be recovered from the tariff, it is fair that any benefit occurring due to subsidy / accelerated depreciation would be factored in while determining the tariff. Hence the Commission decides to determine a levellized tariff taking into account the benefit of accelerated depreciation available under Income Tax Act 1961 and Rules framed under it.

In terms of the above regulation, for the projects availing the benefit of accelerated depreciation, applicable Corporate Tax rate of 34.94% has been considered. For the purpose of determining net depreciation benefits, depreciation @5.28% as per straight line method (Book depreciation as per Companies Act, 1956) has been compared with depreciation as per Income Tax Act, 1961 i.e. 40% of the written down value method. Moreover, additional 20% depreciation in the initial year is proposed to be extended to new assets acquired by power generation companies vide amendment in the section 32, sub-section (1) clause (iia) of the Income Tax Act, 1961.

Depreciation for the first year has been computed at the rate of 40% and the accelerated depreciation at 20%, assuming the Project to be capitalized for the full financial year. The tax benefit has been worked out as per the Corporate Income Tax rate on the net depreciation benefit. The 'per unit levelised accelerated depreciation benefit' has been computed considering the weighted average cost of capital as the discounting factor. The detailed computation of benefit of accelerated depreciation is given as Annexure-2.
The benefit of accelerated depreciation for the project is Rs 0.33/unit. The net levelised tariff of the project after accounting the accelerated depreciation is Rs 4.30/unit.

<u>Tariff</u>

37. Considering the above parameters, the Commission hereby approve the levelised tariff for the electricity generated from the 4.5 MW SHEP developed by M/s CIAL Infrastructures Ltd at Arippara at Rs 4.63/unit without the benefit of accelerated depreciation and Rs 4.30/unit with the benefit of accelerated depreciation. The levelised tariff approved by the Commission is applicable for the entire electricity injected into the grid from the date of synchronization.

KSEB Ltd shall enter into PPA with the petitioner @Rs 4.30/unit, for the purchase of the entire electricity generated from the project.

Order of the Commission

38. After the detailed examination of the petition filed by M/s CIAL Infrastructures Ltd, and comments of the respondent KSEB Ltd and also duly considering the provisions of the Electricity Act-2003, Tariff Policy 2016, and the Regulations notified by the CERC and KSERC, and other relevant documents wherever necessary, the Commission here by orders the following:

(1) The levelised tariff for the electricity generated from the 4.5 MW SHEP installed by M/s CIAL Infrastructures Ltd at Arippara, Kozhikode is approved @ Rs 4.30/unit duly considering the benefit of accelerated depreciation.

(2) The levelised tariff approved by the Commission is applicable for the entire electricity injected into the grid from the date of synchronization.

(3) KSEB Ltd shall reimburse, any tax paid on the RoE, limited to the amount of equity specified in this Order. For claiming the tax, developer shall furnish the proof of payment of such tax to KSEB Ltd.

Petition disposed off. ordered accordingly

Sd/-
Adv. A J Wilson
Member

Approved for issue

Sd/-
C R Satheeshchandran
Secretary

Arippara Small Hydro Project - 4.5 MW

Sl No	Particulars			Remarks
1	Installed capacity	4.5	MW	As per the petition
2	Life of the plant from CoD for tariff determination	23	Years	As per the Implementation Agreement
3	Capacity utilisation factor	37.23	%	As per the DPR
4	Auxiliary consumption	1%		CERC RE Regulation 2020
4	Capital cost of the project	8.39	Rs .Cr/MW	Approved after prudence check
5	Debt: Equity	70:30		CERC RE Regulation 2020
6	Loan tenure	15	Years	
7	Interest rate (MCLR rate+ 2%) (MCLR-last six months- 7.0%)	9.0	%	
8	RoE (post-tax)	14.0	%	
9	MAT/ Income tax	Pass through at actual		
10	Working capital			
	(i) O&M cost for one month			CERC RE Regulation 2020
	(ii) Receivable equivalent to 45 days			
	(iii) Maintenance of spares @15% of the O&M expenses			
11	Interest on WC (MCLR+3.50%)	10.5	%	
12	O&M cost (first year)	34.95	Rs Lakh/ MW/ year	CERC RE Regulation 2020
13	Essacaltion for O&M cost for subsequent years	3.84%	Annually	
14	Depreciation	4.67%	for first 15 years	CERC RE Regulation 2020
		2.49%	For remaining useful life	
15	Discount rate = weighted average cost of capital	10.50	%	
Generic Tariff - for 23 years without the benefit of accelerated depreciation		4.63	Rs/unit	
Accelerated depreciation		0.33	Rs/unit	
Generic Tariff for 35 years with the benefict of accelerated depreciation		4.30	Rs/unit	

Arippara SHP- 4.5 MW

Tariff computation

Sl No	Years		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	Gross Generation	(MU)	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27	3.27
2	Auxiliary consumption	(MU)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
3	Net Generation	(MU)	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24
	Fixed cost																								
4	Interest on loan																								
	Loan at the beginng of the year	(Rs.Cr)	5.87	5.48	5.09	4.70	4.31	3.92	3.52	3.13	2.74	2.35	1.96	1.57	1.17	0.78	0.39								
	Interest on loan	(Rs.Cr)	0.51	0.48	0.44	0.41	0.37	0.33	0.30	0.26	0.23	0.19	0.16	0.12	0.09	0.05	0.02								
5	RoE	(Rs.Cr)	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
6	Depreciation	(Rs.Cr)	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
7	O&M cost	(Rs.Cr)	0.35	0.36	0.38	0.39	0.41	0.42	0.44	0.46	0.47	0.49	0.51	0.53	0.55	0.57	0.59	0.62	0.64	0.66	0.69	0.72	0.74	0.77	0.80
8	Working capital	(Rs.Cr)	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.29	0.29	0.29	0.29	0.30	0.30	0.30	0.31	0.29	0.30	0.31	0.31	0.32	0.33	0.34	0.35
	Interest on WC	(Rs.Cr)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.04	0.04	0.04
9	Total annual fixed cost	(Rs.Cr)	1.63	1.61	1.59	1.57	1.55	1.53	1.51	1.49	1.48	1.46	1.44	1.43	1.41	1.40	1.39	1.21	1.23	1.26	1.28	1.31	1.34	1.37	1.40
10	Fixed cost/unit	(Rs/kWh)	5.05	4.98	4.91	4.85	4.79	4.73	4.67	4.61	4.56	4.51	4.46	4.41	4.36	4.32	4.28	3.73	3.80	3.88	3.96	4.05	4.14	4.23	4.32
11	Discound factor		1.00	0.90	0.82	0.74	0.67	0.61	0.55	0.50	0.45	0.41	0.37	0.33	0.30	0.27	0.25	0.22	0.20	0.18	0.17	0.15	0.14	0.12	0.11
12	Levelised tariff	(Rs/kWh)	4.63																						

Arippara SHP- 4.5 MW

Determination of the benefit of 'Accelarated Depreciation'

Depreciation	90%	of the Capital cost																						
Book depreciation rate	5.28%	first 13 years (Companies Act)																						
	249.00%	Remaining 13 years																						
Tax depreciation rate	40.00%																							
Income tax	29.12	%																						
Years		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Book depreciaton	(Rs. Cr)	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Accelarated depreciation																								
Opening	(%)	100%	40.0%	24.0%	14.4%	8.6%	5.2%	3.1%	1.9%	1.1%	0.7%	0.4%	0.2%	0.1%	0.09%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Allowed during the year	(%)	60.0%	16.0%	9.6%	5.8%	3.5%	2.1%	1.2%	0.7%	0.4%	0.3%	0.2%	0.1%	0.1%	0.03%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Closing	(%)	40.0%	24.0%	14.4%	8.6%	5.2%	3.1%	1.9%	1.1%	0.7%	0.4%	0.2%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Accelarated depreciation	(Rs.Cr)	4.53	1.21	0.72	0.43	0.26	0.16	0.09	0.06	0.03	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Net depreciation benefit	(Rs. Cr)	4.14	0.82	0.33	0.04	-0.13	-0.24	-0.30	-0.34	-0.36	-0.37	-0.38	-0.38	-0.39	-0.39	-0.39	-0.21	-0.21	-0.21	-0.21	-0.21	-0.21	-0.21	-0.21
Tax benefit	(Rs.Cr)	1.21	0.24	0.10	0.01	-0.04	-0.07	-0.09	-0.10	-0.10	-0.11	-0.11	-0.11	-0.11	-0.11	-0.11	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06	-0.06
Net generation	(MU)	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24	3.24
Per unit accelarated depreciation	(Rs/kWh)	3.72	0.73	0.30	0.04	-0.12	-0.21	-0.27	-0.30	-0.32	-0.33	-0.34	-0.35	-0.35	-0.35	-0.35	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19	-0.19
Discount factor		1.00	0.90	0.82	0.74	0.67	0.61	0.55	0.50	0.45	0.41	0.37	0.33	0.30	0.27	0.25	0.22	0.20	0.18	0.17	0.15	0.14	0.12	0.11
Levelised benefit	(Rs/kWh)	0.328																						