

**Order on determination of Capital Cost and
Project Specific Levelized Tariff**

for

Ghanvi II SHEP (10 MW)



**Himachal Pradesh Electricity Regulatory
Commission**

Dated: 28-Sep-2022

**BEFORE THE HIMACHAL PRADESH ELECTRICITY
REGULATORY COMMISSION, SHIMLA**

Petition No. 27/2022

CORAM

Shri Devendra Kumar Sharma
Shri Bhanu Pratap Singh
Shri Yashwant Singh Chogal

IN THE MATTER OF:

Determination of Capital Cost and Levelized tariff for 10MW Ghanvi-II Small Hydro Electric Project of Himachal Pradesh State Electricity Board Limited (HPSEBL) under Section 62, 64 and 86 of the Electricity Act, 2003

AND

IN THE MATTER OF:

Himachal Pradesh State Electricity Board Limited
Vidyut Bhawan Shimla

APPLICANT/ PETITIONER

The Applicant has filed a Petition with the Himachal Pradesh Electricity Regulatory Commission for determination of capital cost and project specific levelized tariff for sale of power from Ghanvi II, 10 MW Small Hydro Power Plant located on Ghanvi rivulet (tributary of River Satluj), District Shimla (H.P.).

The Himachal Pradesh Electricity Regulatory Commission after considering the petition filed by the Applicant, the facts presented by the Applicant in its various filings, the responses of the Applicant to the objections and documents available on record, and in exercise of the powers vested in it under section 62,64 and 86 of the Electricity Act, 2003 passes the following Order determining the capital cost and project specific levelized tariff for 10 MW Ghanvi-II Hydro Power Plant for the period of 40 years, the useful life of the plant starting from FY 2014-15.

The Commission having heard the applicant, interveners and stakeholders through various representations and having had formal interactions with the officers of the HPSEBL and having considered the documents available on record, herewith accepts the application with modifications, conditions and directions specified in the following Tariff Order.

It is necessary to highlight that the Petitioner took significant time in responding to the clarification and queries raised by the Commission. On several occasions, the information provided was either incomplete or did not address the query of the commission adequately.

As a result, even post the written submissions, clarifications were sought verbally from the Petitioner. The delay in submission and lack of complete information remained a major bottleneck which resulted in delay of this Tariff Order.

	Sd/-	Sd/-	Sd/-
Shimla	(Yashwant Singh Chogal)	(Bhanu Pratap Singh)	(Devendra Kumar Sharma)
Dated: 28-Sep-2022	Member	Member	Chairman

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1. BACKGROUND

- 1.1 The Himachal Pradesh State Electricity Board Limited (HPSEBL), Vidyut Bhawan, Shimla-171004 is a State DISCOM having generation assets as well. HPSEBL owns and operate 10 MW Ghanvi II Small Hydroelectric Power Plant. The Ghanvi stage II Small Hydroelectric Project is a run of the river type power plant developed on Ghanvi rivulet, a tributary of Satluj River, which contemplates the generation of 10 MW of power.
- 1.2 The Detailed project report (DPR) for Ghanvi Stage II Small Hydroelectric Project was formulated in November 2003. The Ghanvi II generating station achieved Commercial Operation Date (CoD) on 03-Apr-2014 with its power being entirely utilized by HPSEBL at generic levelized tariff of Rs. 2.25 per unit (as determined by the Commission in its order dated 15th January 2014 in Petition No. 54/2013/2013-14/2967-84) –a provisional tariff allowed, pending the final project specific tariff determination.
- 1.3 The applicant, the Himachal Pradesh State Electricity Board Limited (HPSEBL) filed a Petition (registered as Petition no.27/2022) with the Himachal Pradesh Electricity Regulatory Commission (hereinafter referred to as 'the Commission' or 'HPERC') under sections 62,64 and 86 of the Electricity Act,2003 seeking determination of tariff for sale of electricity generated from 10 MW (5 x 2) Ghanvi-II Small hydro power plant on Ghanvi rivulet near Jeori township in Shimla District, Himachal Pradesh (hereinafter referred to as 'Ghanvi-II SHP' or "the project" or "plant") to the Himachal Pradesh State Electricity Board Limited (hereinafter referred to as 'HPSEBL' or "Board" or "applicant" or "petitioner"), a deemed licensee under the Act, engaged in generation and distribution of electricity in the State of Himachal Pradesh.
- 1.4 Based on prudence check of the petition and responses filed by the Applicant on the several lists of queries raised by the Commission and documents available on the record, this order determines the capital cost and project specific levelized tariff for Ghanvi-II SHP, for the useful life of project starting from year of its COD i.e. FY 2014-15.

Applicable Regulations

- 1.5 The Petitioner filled its petition in accordance with Regulation 14 of the Himachal Pradesh Electricity Regulatory Commission (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination) Regulations, 2012 (hereinafter referred to as "HPERC RE Regulations 2012"), notified on 17-Dec-2012, which reads as follows:-

"14. Project specific levellised tariff.(1) Where the parties have mutually agreed, in the Power Purchase Agreement executed by them, for a project specific levellised tariff, the Commission shall determine such tariff taking into consideration-

(i) prudent capital cost as may be admitted by the Commission duly keeping in view normative capital cost under these Regulations, the cost approved in the Detailed Project Report, the actual expenditure incurred as per auditor's certificate, the information furnished under regulation 18: ..."

- 1.6 The Commission observes that Ghanvi II generating station achieved COD and started supply of power from 03-Apr-2014. Accordingly in this order, for determining the capital cost and project specific levelized tariff of Ghanvi-II SHP, the Commission has considered applicable Regulations at the time of project COD i.e. HPERC RE Regulations 2012.

Procedural Background

- 1.7 HPSEBL filed Petition on 16-Dec-2019, for determination of capital cost and project specific levelized tariff for its Ghanvi II SHP. The Petition was registered with the Commission as Filing No. 190/2019.
- 1.8 Since the submission of the Petition, there have been a series of interactions between the Petitioner and the Commission, both written and oral, wherein the Commission sought additional information/clarifications and justifications on various issues, critical for the analysis of the Petition.
- 1.9 Based on the detailed scrutiny of the petition, clarifications/ information as sought by the Commission from time to time and submission made by the petitioner in response there to, as detailed hereunder, have been taken on record:

Table 1 : Procedural Background

Activity	Dates
Petition by HPSEBL	Filing No.: 190/2019, Dated: 16-Dec-2019
1 st Discrepancy letter	Commission queries dated 14-Jan-2020 Reply received as per M.A. No.: 193/2019 dated 30-Dec-2020
2 nd Discrepancy letter	Commission queries dated: 10-Feb-2021 Reply received as per M.A. No. 201/2021 dated 01-Oct-2021
3 rd Discrepancy letter	Commission queries dated: 01-Nov-2021 Reply received as per M.A. No. 65/2022 dated 28-Mar-2022
4 th Discrepancy letter	Commission queries dated: 18-Jun-2022 Reply received as per M.A. No. 120/2022 dated 02-Jul-2022

Public Hearings

- 1.10 The interim order, inter alia, included direction to the Petitioner to publish the application in an abridged form and manner as per the "disclosure format" attached with the interim order for the information of all the stakeholders in the State. As per the direction, the Petitioner published the public notice in the following newspapers.

Table 2: List of Newspapers for Public Hearing

Sl.	Name of News Paper	Date of Publication
1.	The Tribune	11.05.2022
2.	Amar Ujala	11.05.2022
3.	The Times of India	10.05.2022
4.	Punjab Kesari	10.05.2022

1.11 The Commission published a public notice inviting suggestions and objections from the public on the tariff petition filed by the Petitioner in accordance with Section 64(3) of the Act which was published in the newspapers as mentioned in the table:

Table 3: List of Newspapers for Public Notice by Commission

Sl.	Name of News Paper	Date of Publication
1.	The Times of India (Chandigarh Edition)	13.05.2022
2.	Divya Himachal (Himachal Editions)	13.05.2022

1.12 The stakeholders were requested to file their objections by 15th June 2022. HPSEBL was required to submit replies to the suggestions/ objections to the Commission by 22nd June, 2022 with a copy to the objectors on which the objectors were required to submit rejoinder by 30th June, 2022.

1.13 The Commission decided to conduct public hearing and, therefore, issued a public notice informing the public about the scheduled date of public hearing as 02nd July, 2022 which was extended to 04th July, 2022 due to administrative reasons. All the parties, who had filed their objections/ suggestions, were also informed about the date, time and venue for presenting their case in the public hearing. In order to resolve the objections raised by the Commission in the first Public Hearing, the Commission also held and conducted public hearings on 16th July, 2022 and 06th August, 2022 to provide another opportunity for providing requisite response to the queries of the Commission.

1.14 The Commission has undertaken detailed scrutiny of the submissions made by the Petitioner and the various objections raised by stakeholders for the purpose of issuance of this Order.

2. SUMMARY OF THE PETITION

Salient features of the Petition

- 2.1 This chapter summarizes the submissions made by the Petitioner and subsequent information/clarifications furnished in response to the Commission's queries in the matter.
- 2.2 As per Petition, the Project DPR for Ghanvi II Small Hydroelectric Project (which was formulated in Nov 2003), estimated the project cost at Rs. 49.50 Crores and estimated construction period of 3 years.
- 2.3 As per HPSEBL's petition, the actual CoD was achieved on 03-Apr-2014, with an overall project cost of Rs. 180.57 Crores.
- 2.4 The Petitioner has highlighted several reasons for cost and time overrun of the project which are stated as follows:
 - The execution of main components of project was delayed mainly due to slow progress of previous contractors and reassigning of the work.
 - The land cost was increased from the estimated amount at the time of acquisition.
 - The revision of construction drawings, geological overbreak encountered, blockage of roads/ landslides and execution of extra items resulted in slower execution of work at site and thus completion of different components of project took considerably more time.
 - The frequent labor strikes delayed or stopped the construction work. In addition to that, bad or adverse weather conditions in the region and non-availability of material at site also led to delay in timely completion of different activities of project components.
 - There was a significant increase in price of equipments, cost index of labor and material, deviation in items/ quantity, escalation of work done and execution of extra items like concreting, excavation, earth work, steel etc.;
 - Delay in commissioning of project led to increase in establishment costs especially enhancement in pay and allowances after 6th pay commission implementation;
 - Imposition of Departmental Charges/ Interest During Construction and other charges also had impact on the overall cost of project.

2.5 The details of the escalation in capital cost due to time and cost overrun as submitted by the Petitioner has been summarized in subsequent paras:-

Capital Cost

2.6 The Petitioner has provided the following break up of capital cost in its petition:

Table 2 : Capital Cost structure submitted by Petitioner (Rs. Crores)

Particular	Cost as per DPR	Actual Cost submitted by Petitioner	Increase in Cost
	(A)	(B)	(B)-(A)
Preliminary	0.49	0.57	0.08
Land	0.36	0.82	0.47
Power Plant	17.21	45.48	28.26
Building	1.27	0.78	0
Plantation	0.12	0.45	0.34
Miscellaneous	0.97	3.20	2.23
Communication	1.27	0.97	0
Special Tools and Plants	0.48	0.01	0
Environment & Ecology	0.73	0.29	0
Maintenance	0.21	0.14	0
Losses on stock	0.05	0.01	0
Work except Land	2.28	0	0
T&P@10%ofworks	0.23	0	0
Receipts and recoveries	(0.37)	0	0.37
Sub-total of Direct Charges	25.30	52.73	27.42
Cultivated land	0.003	0	0
Audit and accounts charges	0.23	0	0
Sub-total of Indirect charges	0.23	0	0
Total of direct & indirect charges	25.54	52.73	27.19
Electrical work	18.16	32.41	14.25
Transmission	1.17	3.37	2.20
Subtotal of Electrical work and transmission	19.32	35.78	16.46
Establishment	0	37.51	37.51
Contingency	0	1.07	1.07
Departmental Charges (DC)	1.28	10.84	9.56
Interest During Construction	3.35	42.65	39.30
Subtotal of IDC, establishment and others	4.63	92.07	87.44
Grand Total	49.50	180.58	131.09

2.7 The Petitioner submitted that provision of original cost estimated in the Detailed Project Report (DPR) was much on the lower side. Moreover, some of the provisions were not made in the original DPR and this led to deviation in materials and number of items required than estimated originally, leading to increase in scope of work. Further delay in execution of works due to Force Majeure conditions like landslides, labour strikes, bad weather conditions, etc. also led to increase in project cost. Also, the original cost was estimated based on old price indices due to which there is an increase in the cost.

Subsidy and Funding Pattern

2.8 The Petitioner has claimed that a capital subsidy of Rs. 8.46 Crores was received from MNRE which was considered for tariff determination.

2.9 As per Petitioner's submission, the actual loan, equity and grant availed for the project are as follows:

Table 3 : Funding Structure submitted by Petitioner

Particulars	Amount (Rs. Crores)	% of total
Loan	89.13	49%
Equity	82.99	46%
Grant	8.46	5%
Total	180.58	100%

Levelized Tariff

2.10 The Petitioner has considered HPERC RE Tariff Regulations, 2012 along with amendment to Regulations notified on 11th February 2015 for computation of levelized tariff for the Ghanvi II plant.

2.11 The Petitioner has submitted that for project specific tariff determination, the annual capacity utilization factor shall be worked out on normative basis or the basis of data for 75% dependable year as per the approved Detailed Project Report, whichever is higher. The design energy of the plant has been 48.75 Mus.

2.12 However, for the purpose of tariff calculation, the Petitioner has considered average of actual generation from FY 2014-15 to FY 2018-19 (except FY 2017-18) i.e. 39.75 MUs. The actual generation for the FY 2017-18 is not considered in the average, since it is low due to shutdown activity. However, the design energy at 95% plant availability is 48.75 MUs. The Petitioner has requested that the saleable energy for tariff computation be considered based on actual generation, i.e. 39.75 MUs.

2.13 The table below summarizes the parameters used by the Petitioner for calculation of project specific levelized tariff.

Table 4 : Assumptions submitted by Petitioner

Sl.	Assumption Head	Sub-Head	Unit	Amount
1	Power Generation	Saleable Energy	MU	39.75
		Installed Power Generation Capacity	MW	10.00
		Auxiliary Consumption	%	1.00%
		Transmission Losses	%	0.00%
		COD	Date	03-Apr-2014
		Useful Life	Years	40
2	Royalty and LADF	Royalty	%	12.00%
		LADF	%	1.00%
3	Project Cost	Gross Project Cost	Rs Crores	180.57
		Capital subsidy (if any)	Rs Crores	8.46
4	Project Financing	Repayment Period	years	12
		Weighted. Average interest Rate	%	11.61%
		RoE for first 10 years	% p.a	19.00%
		RoE 11 th year onwards	% p.a	22.00%
5	Financial Assumptions	Income Tax		
		MAT Rate (for first 10 yr)	%	15.00%
		Corporate tax rate (11th Year onwards)	%	25.00%
		Depreciation		
		Depreciation Rate for first 12 years	%	5.83%
		Depreciation Rate 13th year onwards	%	0.71%
		Salvage value Rate	%	10%
		Interest on Working Capital		
		O&M Charges	Months	1
		Maintenance Spare (% of O&M expense)	%	15%
		No. of months of Receivables	Months	2
		SBI base rate average	%	9.88%
		Increase in basis points	%	3.50%
		Interest on Working Capital	%	13.38%
		O&M Expenses		
		Base Year O&M expense	Rs Crore /MW	0.18
		Escalation Rate	%	5.72%
		Discount factor		
		Discount Rate (WACC)	%	12.58%

2.14 Based on these assumptions, the Petitioner has prayed for a project specific levelized tariff of Rs. 8.64 per kWh.

3. COMMENTS/ OBJECTIONS FILED BY STAKEHOLDERS

The Commission held multiple public hearings and discussions with the Petitioner. There were no comments or suggestions received from any stakeholder with respect to the petition for determination of Capital cost and Project Specific Levelized tariff for Ghanvi II hydro generating station filed by the Petitioner. However, with an objective to have better clarity with respect to the high capital cost and tariff claimed for the Ghanvi II HEP, the Commission raised several questions during the public hearing held on 04th July, 2022. During the hearing, the Petitioner was unable to clarify all the questions to the satisfaction of the Commission. Therefore, the Commission also conducted public hearings on 16th July, 2022 and 06th August, 2022 to provide another opportunity to the Petitioner to respond to the requisite queries of the Commission.

During the subsequent hearings, the responses and additional information as provided by the Petitioner has been considered by the Commission while drafting this Order.

4. DETERMINATION OF CAPITAL COST

Introduction

- 4.1 The Petitioner has filed a project specific tariff petition for its Ghanvi II 10 MW power generating station in line with HPERC RE Regulations 2012. As part of its petition, HPSEBL has submitted that Ghanvi II generating station has achieved Commercial Operation Date (CoD) on 3rd April, 2014. Also, the Petitioner has submitted that in the absence of a tariff petition, the Commission has been considering an interim tariff of Rs. 2.25 per unit in the distribution MYT Order for computing the power purchase cost for Ghanvi II subject to final tariff determination.
- 4.2 Accordingly, the Petitioner has submitted the present petition for capital cost approval and determination of tariff as per the terms and conditions laid out in HPERC (Promotion of Generation from the Renewable Energy Sources and Terms and Conditions for Tariff Determination), 2012 and subsequent amendments thereof (referred to as "HPERC RE Regulations, 2012" hereafter).
- 4.3 Section 14 of the HPERC RE Regulations 2012, provides for determination of project specific tariff on the basis of prudent capital cost admitted by the Commission, which is reproduced hereunder:
- "14. Project specific levelled tariff. (1) Where the parties have mutually agreed, in the Power Purchase Agreement executed by them, for a project specific levelled tariff, the Commission shall determine such tariff taking into consideration-*
- (i) prudent capital cost as may be admitted by the Commission duly keeping in view normative capital cost under these Regulations, the cost approved in the Detailed Project Report, the actual expenditure incurred as per auditor's certificate, the information furnished under regulation 18: ..."*
- 4.4 In accordance with HPERC RE Regulations 2012, the Commission has undertaken a detailed analysis of the capital cost for the project, under various heads, based on assessment of documentary evidence including Project DPR, Auditor Certificate, Work Orders/ Completion Certificates of contractors, loan agreements etc.
- 4.5 The project DPR estimated the Capital Cost as Rs. 48.20 Crores (including IDC). The Petitioner in its Petition claimed the capital cost as per DPR to be Rs. 49.50 Crores. However, on scrutiny of the DPR, the Commission observed that capital cost as per DPR is Rs. 48.20 Crores, which is addition of Rs. 44.85 Crores of hard costs

(Preliminary, Land, Miscellaneous, Civil, Audit and account charges, Electrical, Establishment and Transmission costs) and Rs. 3.35 Crores of IDC.

- 4.6 Further the Petitioner as part of its submissions, furnished an Auditor Certificate as per which the total project cost is stated as Rs. 156.58 Crores as on COD, with an additional capital expenditure post COD of Rs. 2.81 Crores. In its petition, the Petitioner has claimed total project cost of Rs. 180.57 Crores. A comparison of the project cost as per DPR, Auditor certificate and Petition is as follows:

Table 5: Comparison of Project Cost as per DPR/Petition/Auditor Certificate (Rs. Crores)

Cost Head	DPR	Auditor Certificate	Petition
Preliminary Expenses	0.49	0.57	0.57
Land	0.36	1.71	0.82
Civil Works	20.97	82.17	48.13
Miscellaneous	0.97	0.01	3.20
Audit and accounts charges	0.23	0.00	0.00
Electrical works	18.16	31.41	32.41
Transmission works	1.16	3.03	3.37
Establishment Charges	2.51	0.00	37.51
Contingency Charges	0.00	0.00	1.07
Departmental Charges (DC)	0.00	10.70	10.84
IDC	3.35	26.98	42.65
Grand Total	48.20	156.58	180.57
Post COD, addl. capex	-	2.81	-

- 4.7 The Commission has undertaken detailed prudence check and adequate assumptions, wherever required, for approving the capital cost of the Ghanvi II generating station. The scrutiny and prudence check undertaken by the Commission has been discussed in the following paragraphs.

Preliminary Expenses

- 4.8 Expenditure towards Preliminary Expenses was estimated as Rs 0.49 Crores in the DPR. Further the cost as per Auditor Certificate provided by Petitioner is Rs 0.57 Crores and is claimed to be Rs. 0.57 Crores in the petition.
- 4.9 The Commission asked the Petitioner to clarify the nature of these Preliminary Expenses. The Petitioner in its submissions clarified that expenditures claimed towards Preliminary Expenses involved initial works undertaken before the DPR formulation including discharge observation/geological exploratory works and residential accommodations etc. under Survey & Investigations of Project since 1995.

- 4.10 The Petitioner was told to provide appropriate documentary evidence to support its claim for the expenditure incurred towards Preliminary Expenses. The Petitioner in its submissions provided a list of works undertaken between 1995 and 2001 which included expense towards construction of retaining wall, construction of residential colony, construction of road, etc.
- 4.11 Considering the petty nature of these expenses, the Commission has allowed the amount of Rs. 0.57 Crores as Preliminary Expenses, as stated under the Auditor Certificate.

Table 6 : Preliminary Expenses approved by Commission (Rs Crores)

Cost Head	Cost as per:			Approved
	DPR	Auditor Certificate	Petition	
Preliminary	0.49	0.57	0.57	0.57

Land cost

- 4.12 The expenditure towards Land was estimated as Rs 0.36 Crores in DPR. Further the land cost as per Auditor Certificate provided by the Petitioner is Rs. 1.71 Crores and is claimed to be Rs 0.82 Crores as per the Petition.
- 4.13 The Commission asked the applicant to provide reasons for escalation in the land cost. In response, the Petitioner clarified that the cost of land increased on account of following reasons:
- Increased land requirement: The area of land acquired increased from 2.52 Hac to 3.33 Hac as during the progress of work, some additional land for protection works, path and other project components were actually required on urgent need basis.
 - Increased cost of land: The Petitioner submitted that the cost of Private/Govt. land increased due to actual increase in cost of the award of land as compared to the unit rate of land considered in the "B-Land" chapter of the DPR.
- 4.14 The Commission requested the Petitioner to furnish documentary evidence for the land cost incurred. Based on analysis of submissions made by the Petitioner, the Commission observed that considering all documentary evidence provided by the Petitioner the value of land is added up to Rs. 0.65 Crores. The Commission asked the Petitioner to clarify the reasons for mismatch in costs as per Petition, Auditor Certificate and documentary evidence. The Petitioner in its submissions clarified that the cost as per Auditor Certificate should be considered as final cost for land and provided a revised breakup for the cost head.

4.15 Considering that many of the documentary evidence submitted pertained to smaller amounts for compensation of trees and compensation of crops, the Commission has allowed Rs. 1.71 Crores against cost of Land, as certified under Auditor Certificate.

Table 7 : Approved expenses towards Land (Rs Crores)

Cost Head	Cost as per:				Approved
	DPR	Auditor Certificate	Petition	Documentary Evidence	
Land	0.36	1.71	0.82	0.65	1.71

Civil Works

4.16 The expenditure towards Civil Works was estimated as Rs 20.97 Crores as per DPR. Further, the cost of Civil Works under the Auditor Certificate provided by the Petitioner is Rs 82.17 Crores and is claimed to be Rs 48.13 Crores as per Petition. The cost as per Auditor Certificate is significantly higher than cost claimed under petition. In response to the queries of the Commission, the Petitioner clarified that the cost under Auditor Certificate is inclusive of expenditure incurred towards Establishment Costs (discussed in subsequent paras of this chapter) and, therefore, is higher than the proposed cost. The Commission has analysed the expenses towards Civil works as per the claim of the Petitioner i.e. Rs. 48.13 Crore.

4.17 The petitioner was directed to justify the reasons for escalation in Civil Works claimed in the petition from the cost envisaged in DPR and submit necessary documentary evidence for the works undertaken.

4.18 The Petitioner in its reply to various queries by the Commission submitted a list of Civil Works undertaken with copies of their Work Order and Completion Certificates. This list of Civil Works also included a list of other miscellaneous works.

4.19 Based on the analysis of these documentary evidence, the Commission has considered the value of Civil Works as follows:

- For contracts/ works where the Petitioner has submitted completion certificates (by HPSEBL to Contractor) as documentary evidence, the Commission has considered cost as per the completion certificate. The value of such Civil Works with Completion Certificates adds up to Rs. 12.37 Crores.
- In case where work completion certificate was unavailable, the Commission observed that the Petitioner has provided two values – amount of initial award (as per Work Order) and final amount of total work done. The Petitioner did not provide any clarifications for increase in the amount of work done vis-à-vis the amount of initial award. Albeit in some of the contracts, it was observed that the amount of final work done was lower than amount of initial award. Accordingly, for each contract, the

Commission has considered the lower of the value of the initial work awarded (as per Work Order) or the total work done. The value of such Civil Works, with Work Orders, adds up to Rs. 21.11 Crores.

- For other miscellaneous civil works, out of Rs 22.79 Crores claimed towards such works, the Petitioner was able to provide supporting documentary evidence, in the form of contract copies, only for Rs 8.60 Cr. Further the Commission observed that among the contract copies provided, some contracts were dated even before the DPR formulation (ranging from 1995 to 2000). The Commission has not considered such works undertaken before the DPR formulation, for which a separate cost is allowed under Preliminary Expense head. Thus, the Commission has allowed cost of Rs. 4.79 Crores for contracts which fall during the period between start and end of project.

4.20 Accordingly, the Commission has approved total expenditure towards Civil Works, as follows:

Table 8 : Approved expenditure towards Civil Works (Rs. Crores)

Sl.	Contractor	Initial Award. No/Date	Amount as per:			Approved
			Initial Award/ Work Order	Final work done	Completion Certificate	
Contracts with Completion Certificate						
1	M/s Himalaya Const Co. Pvt.Ltd.	17-Dec-04	5.70	5.34	5.34	5.34
2	M/s Himalaya Const Co Pvt. Ltd.	3-Jun-06	3.35	5.17	5.03	5.03
3	M/s Himalaya Const Co. Pvt. Ltd.	31-May-06	1.22	2.00	2.00	2.00
A.	Sub-total					12.37
Contracts with Work Orders						
4	M/s Prem Laxmi	9-May-05	1.47	NA	NA	1.47
5	M/s SSJV Pvt. Ltd.	10-Nov-05	8.67	4.31	NA	4.31
	M/s MS Hydro P. Pvt. Ltd.	29-Oct-09	12.23	NA	NA	12.23
6	M/s Pilot Engg. Works	4-Sep-06	1.68	1.45	NA	1.45
7	M/s	25-May-10	NA	0.74	NA	0.74

Sl.	Contractor	Initial Award. No/Date	Amount as per:			Approved
			Initial Award/ Work Order	Final work done	Completion Certificate	
	Mahender Kumar Shah					
8	M/s Boom Sys. Ltd	9-Dec-09	0.58	NA	NA	0.56
9	M/s Srikhand Cost Co.	10-Oct-11	0.35	0.42	NA	0.35
B.	Sub-total					21.11
C.	Other miscellaneous works	Several contracts between 2004 - 2014	4.79	NA	NA	4.79
Total of Civil Works (A+B+C)						38.27

Electrical Works

- 4.21 The DPR estimated the cost of Electrical Works as Rs. 18.16 Crores. The Petitioner has claimed Rs. 32.41 Crores as cost of these works in Petition. The Auditor Certificate states the cost of Electrical Works as Rs. 31.41 Crores.
- 4.22 As part of deficiency note, the Petitioner was asked to provide reasons for escalation in cost, along with supporting documentary evidence. Based on analysis of the submissions made by the Petitioner, the Commission observed that the amount as per contract copies provided, add up to Rs. 29.49 Crores only as against the claim of Rs. 32.41 Crores.
- 4.23 Further in its reply (received as per M.A. No. 120/2022 dated 02-Jul-2022), the Petitioner clarified that the actual cost incurred for Electrical works was indeed Rs 29.49 Crores only.
- 4.24 Accordingly, the Commission allows Rs. 29.49 Crores of expenditure towards Electrical Works, as follows:

Table 9 : Approved expenditure Towards Electrical Works (Rs. Crores)

Sl.	Name of Work	Name of Supplier	Approved (as per Work Order)
1.	Providing & Erection of Electro- Mechanical Equipment's and 66/22KV s/Yard equipment for 2x5MW Ganvi Stage-II	M/S Adritz Hydro Pvt Ltd,	8.36
2.	Supply, Installation and testing and commissioning 415VAC Switch Gear for Ganvi	M/S JVV Electrotech Pvt Ltd	0.23

Sl.	Name of Work	Name of Supplier	Approved (as per Work Order)
	II		
3.	Supply & Installation Service of various equipment for Ventilation and A.C., Exhaust System of 2x5MW Ganvi Stage-II	M/S Joss Engg Works	0.78
4.	Supply installation testing and commissioning of 100 KVA 3-4 Wire 50 Hz 0.8 PF D.G. set for 2x2MW Ganvi Stage-II	M/S Spain Electro	0.09
5.	Supply and installation of illumination and electric installation for Ganvi HEP Stage-II 2X5MW for Gang stage- 11	M/S United Works	0.81
6.	Supply, Laying ,Dressing ,Testing, Termination and Erecting of Power and Control Cable of 2x5 MW for Ganvi Stage-II	M/S Nicco Corporation	1.61
7.	Installation testing and commissioning of 110V 513AH batteries battery chargers and DC distribution board along with all accessories for Ganvi stage -II	M/S Rishabh Sales Corporation	0.70
8.	Auxiliary transformer, EOT Cranes, Switchyard equipment	M/S VA Tech. Escher Wyse Flovel Ltd.	16.45
9.	Supply and installation service of fire fighting system of 2x5 MW for Ganvi Stage-II	M/S Fireguard Engineers	0.47
	Total cost approved for Electrical Works		29.49

Transmission Work

4.25 The DPR estimated the cost of Transmission Works as Rs. 1.16 Crores. The Petitioner has claimed Rs. 3.37 Crores as cost of these works in Petition. The Auditor Certificate states the cost of Transmission Works as Rs. 3.03 Crores.

4.26 As part of deficiency note, the Commission asked the Petitioner to provide clarifications regarding nature of these costs, reasons for escalation in cost, along with supporting documentary evidence.

4.27 The Petitioner did not provide copy of any contract or work order for the Transmission Works undertaken. The Petitioner submitted that the transmission line was capitalized in the accounts during 01/2015 vide Transfer Entry Order No. 39 and the cost of transmission line was booked separately with the Electrical System (ES) division, which falls under EHV Transmission business of HPSEBL. The Petitioner further submitted that the transmission line was later transferred to RE Division of Ghanvi Power House vide Transfer Entry Order No. 23 during April 2018. The Petitioner provided copy of internal transfer memo as supporting documentary evidence.

4.28 The Commission observes that this cost would have been normally booked under the distribution business and later transferred to the respective generating station. Accordingly, the Commission has allowed the cost of Transmission Works as certified under the Auditor Certificate.

Table 10 : Approved expenses towards Transmission Works (Rs Crores)

Cost head	Cost as per:			Approved
	DPR	Auditor Certificate	Petition	
Transmission Works	1.16	3.03	3.37	3.03

4.29 However, considering that the Commission has been approving the capitalization of various EHV and other distribution infrastructure works of the Petitioner as per its claim in the various Distribution Business Tariff Orders, the Commission directs the Petitioner to file for decapitalization of this cost of EHV works in its next tariff/ true-up petition for Distribution Business.

Establishment Charges

4.30 The Petitioner has claimed Rs. 37.51 Crores as Establishment Charges in the Petition. The Establishment charges estimated in the DPR was Rs 2.51 Crores. The Auditor Certificate has not provided a separate line item towards Establishment Charges. However, in response to the queries of the Commission with respect to lower Civil Works expense claim vis-à-vis the Auditor Certificate, the Petitioner had clarified that the department charges in the Auditor Certificate was included under Civil Works. However, the amount of establishment charges considered by the Auditor was not clarified by the Petitioner.

4.31 The Commission observes that as per DPR, Establishment Cost is towards the costs incurred towards the staff and office infrastructure during the construction of the project and is estimated in the DPR as 11% of the hard cost less land cost.

4.32 The Commission asked the Petitioner to provide a detailed breakup of the Establishment Costs claimed under the petition, along with supporting documentary evidence as part of the deficiency note. Based on the scrutiny of the details submitted by the Petitioner, the Commission observed that several of the works claimed by Petitioner under Establishment Charges were similar to work heads of Civil Works or Electrical works, including the following:

Table 11 : Examples of Similarity between Work heads of Establishment Charges and Civil Works

Sl.	Considered under Civil works		Considered under Establishment Cost	
	Name of contractor/ work	Amount (Rs. Crores)	Name of contractor/ work	Amount (Rs. Crores)
1.	M/s Pilot Engineering Works- Penstock works	1.68	M/s Pilot Engineering Works- Fabrication of penstock	2.00
2.	M/s Himalayan Construction Co. Pvt. Ltd- Power House Cavern	5.03	M/s Himalayan Construction Co. Pvt. Ltd-Power house cavern i/c TRT of unit I and II and TRC enlargement of existing drift for of cable cum emergency exit 3.4 mtr D shaped etc.	1.21
3.	M/s SSJV Pvt Ltd- C/o Trench Weir etc.	8.67	C/o Trench Weir conveyance channel, control structure, power channel, type D tank SFC	12.00

4.33 Therefore, the details provided by the Petitioner did not reconcile with the nature of expense required to be booked under Establishment charges. Further, similar expenses have already been approved under other expense heads. Accordingly, the Commission has not considered the breakup and documentary evidence provided by Petitioner for Establishment Costs. Instead, the Commission has restricted the Establishment Charges to the extent of 11% as per the methodology provided in the DPR. Using this approach the Commission has approved Establishment Charges of Rs. 7.77 Cr. as follows:

Table 12 : Approved expenses towards Establishment Charges (Rs. Crores)

Parameter	Item	Approved
Hard Costs, less Land Cost		
Preliminary Expense	A	0.57
Civil Works	B	38.27
Electrical Works	C	29.49
Transmission Works	D	3.03
Establishment Cost	11%*(A+B+C+D)	7.85

Departmental Charges

- 4.34 The Petitioner has claimed an amount of Rs. 10.84 Crores towards departmental charges in its Petition, the Auditor Certificate reflects an amount of Rs. 10.70 Crores.
- 4.35 Based on clarification sought by the Commission regarding nature of work, the Petitioner has submitted that this cost is claimed against the charges deposited with the “amount deposited for environmental expenses with HP forest department authorities”.
- 4.36 The Commission asked the Petitioner to submit supporting documentary evidence for expenditure claimed as Department Charges. As per analysis of the documentary evidence provided by the Petitioner, the Commission observes that the amount as per these evidence add up to Rs 1.07 Crores only. This amount was spent towards afforestation, forest land, Compensation against loss of environmental value of the forest land being diverted, etc.
- 4.37 Accordingly, the Commission after proper perusal of the supporting documents and the justification provided by the petitioner in this regard, has allowed the Departmental Charges of Rs 1.07 Crores.

Table 13 : Approved expenses towards Departmental Charges (Rs Crores)

Cost Head	Cost as per:			Approved
	Auditor Certificate	Petition	Documentary Evidence	
Departmental Charges	10.70	10.84	1.07	1.07

Contingency Charges

- 4.38 The DPR estimated Contingency Charges as Nil. The Petitioner has claimed Rs. 1.07 Crores as Contingency Charges in Petition. The Auditor Certificate doesn't provide any cost head for Contingency Charges.
- 4.39 The Petitioner was asked to submit the documentary evidence in support of expenditure claimed under Contingency Charges. The Petitioner in its response, only provided year-on-year breakup of the cost, without any documentary evidence for actual cost incurred.
- 4.40 The Commission observes that Contingency Charges are generally considered during estimation of project cost to account for any unforeseen expenses during construction phase. However, the inclusion of the same in the actual capital cost is not justifiable as all expenses are already accounted for on actual basis. As the Commission is considering actual capital expenditure incurred on the project, the Contingency Charges claimed by the Petitioner are disallowed by the Commission.

Table 14 : Approved expenses towards Contingency Charges (Rs Crores)

Cost head	Cost as per Petition	Approved
Contingency Charges	1.07	-

Capital Cost approved (excluding IDC)

4.41 In line with the various cost heads as discussed in this chapter, the total capital cost, excluding IDC, as approved by the Commission is as follows:

Table 15 : Approved Capital Cost, excluding IDC (Rs. Crores)

Particular	Approved Cost
Preliminary	0.57
Land	1.71
Civil Works	38.27
Electrical work	29.49
Transmission	3.03
Establishment	7.85
Departmental Charges	1.07
Grand Total	81.99

Project timelines and delays during construction period

4.42 Based on review of DPR for Ghanvi-II SHP which was formulated in November 2003, the estimated construction period of 3 years was envisaged. However, the Petitioner has submitted the actual COD of the project as 03-Apr-2014.

4.43 The Petitioner was asked to provide clarifications/ reasons for the delay in project implementation along with necessary documentary evidence in support of its claim. Based on the analysis of these submissions, the Commission has reworked the allowed Start Date and End Date of the project.

Start Date of project

4.44 The Petitioner was directed by the Commission to submit copy of MoU or implementation agreement for the project. The Petitioner replied that no MoU or Implementation agreement has been signed for the project with Government of Himachal Pradesh (GoHP) as the need for implementation agreement was required as per GoHP Hydro Policy 2006, and the project was conceptualized before 2006.

4.45 Based on analysis of contract copies shared by the Petitioner for various civil and electrical works, excluding works undertaken prior to the formulation of DPR, the Commission observes that the date of award of first contract is 17-Dec-2004 (for C/o

HRT, awarded to M/s Himalaya Const Co. Pvt. Ltd.). In absence of any other document, the Commission has considered the date of award of first contract as the start date of the project.

End Date of project

- 4.46 The Petitioner provided several Extension of Time (EOT) orders, approved by HPSEBL for various contracts, in support of its delay in implementation of the project. Each EOT list activities/ events that led to time delays, with details of start date and end date of the event.
- 4.47 The Commission observes that the several of these events listed under EOTs were non-force majeure in nature and the petitioner was unable to provide any documentary proof in support of these delays and also to clarify that these were not under control of the Petitioner/ contractors or were of Force Majeure in nature.
- 4.48 Section 14 of the HPERC RE Regulations 2012 allows the Petitioner time over run for delay in project, subject to certain conditions which is reproduced hereunder:

“Provided that in case of delay in execution of the project, the Commission shall consider the time overrun cost as follows-

- a) Where the delay is due to factors entirely attributable to the renewable energy generator, the entire cost shall be borne by the renewable energy generator.*
- b) Where the delay is due to force majeure, the Commission may allow the net additional cost incurred on this account to the renewable energy generator: and*
- c) In a situation not covered under clauses (a) and (b), the Commission may allow the additional cost, not exceeding 50% of the net additional cost incurred due to time overrun”*

In accordance with above HPERC RE Regulations 2012, the Commission has allowed 100% pass through of the time delays for force majeure events and 50% pass through of time delays for events which were non-force majeure in nature and also not attributable to the Petitioner entirely.

- 4.49 The Commission has considered events relating to natural phenomenon as Force Majeure Events (FME)- such as floods, heavy rainfall and weather effect, as per EOTs submitted by the Petitioner. Other remaining delays on account of events such as labour strikes, delay in procurement, road blockades by local villagers and power failure as non-force majeure events. Further events, without any identified Start or End Date are also not considered for 100% pass through of time delay by the Commission. The list of FME events allowed by the Commission are as follows:

Table 16: List of FME events approved by the Commission

Sl.	Contractor	EOT Reference	Reason	Start Date	End Date	Time Delay allowed (days)
1.	M/s Pilot Engineering Works	HPSEBL(Sect)/409-Ganvi-EOT(TRT)/2016-40685-92	Stoppage of work by administration due to flash flood in Bhavi village	14-08-2007	03-09-2007	20
2.	M/s Hydro Power Ltd	HPSEB/Sectt/409-ganvi-EOT-PH(39C)/2010-73057-64 dated 25-10-2012	Flood	15-08-2010	14-10-2010	22
3.	M/s Hydro Power Ltd	HPSEB/Sectt/409-ganvi-EOT-PH(39B)/2010-49426-32 dated 22-10-2013	Weather affect	31-05-2012	07-10-2012	22
Total Time Delay on account of FME events (days)						64

4.50 The time delay allowed and end date of the project, is determined as follows:

Table 17: Allowed time delay and End Date of project, by the Commission

Parameter	Unit	Item	Value
Start Date of project, approved by Commission	DD-MMM-YYY	A	17-Dec-2004
Actual COD	DD-MMM-YYY	B	03-Apr-2014
Time delay, claimed by Petitioner	Days	C=B-A	2,299
Time delay, on account of FME events (adjusted for overlapping days)	Days	D	64
Time delay, on account of Non-FME events	Days	E=C-D	2,235
Total time delay allowed	Days	F=D+50%*E	1,118
Construction period, as per DPR	Years	G	3

Parameter	Unit	Item	Value
End Date of project, approved by the Commission	DD-MMM-YYY	$H=A+G*365+F$	12-Mar-2011

4.51 Based on these assessments as discussed, the Commission has allowed Project Start Date of 17-Dec-2004, Project End Date of 12-Mar-2011 considering a construction period of 3 years and allowed time delay of 1,182 days (3.24 years).

Interest during Construction (IDC)

4.52 The DPR estimated the Interest During Construction as Rs 3.35 Crores. The Petitioner has claimed an amount of Rs. 42.65 Crores as actual IDC incurred in the petition. However, the Auditor certificate submitted by the Petitioner reflects an amount of Rs. 26.98 Crore towards IDC.

4.53 Considering the revision of project cost, interest rate, time frame for execution with respect to DPR, the IDC considered in the DPR cannot be considered as the base for approval of IDC. Therefore, the Commission has adjusted the actual IDC incurred by Petitioner for disallowances in capital cost and time overrun as discussed in earlier paras of this Order, using following approach:

- Step 1: The IDC amount incurred by Petitioner is adjusted for the capital cost allowance by the Commission, as follows:

Table 18 : IDC adjusted for capital cost allowance (Rs. Crores)

Parameter	Item	Amount
Capital Cost, claimed in Petition	B	180.57
<i>Less: IDC, claimed in petition</i>	C	42.65
Capital Cost claimed, excl. IDC	$D=B-C$	137.92
Capital Cost approved, excl. IDC	E	81.99
Ratio of capital cost allowance	$F=E/D$	0.59
IDC adjusted for capital cost allowance	$C*F$	25.35

- Step 2: Normative IDC is calculated using the loan drawl schedule as envisaged under DPR, for the normative loan amount approved by the Commission. The normative loan amount is approved by the Commission based on total capital cost allowed, as discussed in subsequent paras of this Order (including IDC cost). Actual weighted average interest rate of 11.61%(as claimed by the Petitioner) is used for calculation of IDC.

Table 19 : Normative IDC calculation (as per DPR schedule) in Rs. Crores

Parameter	Item	Year 1	Year 2	Year 3
Loan Drawl schedule as per DPR	A	4.03	10.38	12.48
Loan schedule as per DPR (%)	B	15%	39%	46%

Parameter	Item	Year 1	Year 2	Year 3
Normative Loan, approved by Commission	C	85.62		
Normative Loan drawl schedule	D=C*B	12.83	33.05	39.74
IDC calculation				
Opening Loan	E	0.00	12.83	45.88
Addition	D	12.83	33.05	39.74
Closing Loan	F	12.83	45.88	85.62
Interest Rate	G	11.61%		
Normative IDC (as per DPR schedule)	H=G*Avg. of E and F	0.74	3.41	7.63
Total Normative IDC (as per DPR schedule)	Sum of H	11.79		

- Step 3: The normative IDC (as per DPR schedule) calculated is subtracted from the IDC adjusted for the capital cost allowance, to calculate excess IDC amount.

Table 20 : Excess IDC amount (Rs. Crores)

Parameter	Item	Amount
IDC adjusted for capital cost allowance	A	25.35
Normative IDC (as per DPR schedule)	B	11.79
Excess IDC	A-B	13.57

- Step 4: The Excess IDC amount is adjusted for excess period allowed by the Commission. As discussed in earlier paras of this Order, the Commission has approved start date and end date for the project. The ratio of excess time period allowed and adjusted IDC is calculated as follows:

Table 21 : IDC adjusted for ratio of excess time period allowed

Parameter	Item	Value
<i>Start Date of the Project</i>	A	17-Dec-2004
<i>Actual COD</i>	B	03-Apr-2014
End Date approved by the Commission	C	12-Mar-2011
Construction period as per DPR (years)	D	3
Excess time actually taken by project (days)	E=B-(A+D*365)	2,299
Excess time allowed by Commission (days)	F	1,182
Ratio of excess time period allowed	G=F/E	0.51
Excess IDC (Rs. Crores)	H	13.57
Excess IDC adjusted for excess time period allowed (Rs. Crores)	H*G	6.97

- Step 5: The total IDC allowed is taken as sum of Excess IDC (adjusted for excess time period allowed) and Normative IDC (as per DPR schedule), as follows:

Table 22 : IDC allowed by the Commission (Rs. Crores)

Parameter	Item	Amount
Normative IDC (as per DPR schedule)	A	11.79
Excess IDC (adjusted for excess time period allowed)	B	6.97
Total IDC allowed by the Commission	A+B	18.76

4.54 Accordingly, the Commission has approved Rs 18.76 Crores as the IDC cost.

Summary of approved Capital Cost

4.55 In line with the various elements of hard cost, IDC, Establishment Cost and Departmental charges approved in preceding sections, the approved project cost for Ghanvi II as on COD vis-à-vis the project cost claimed by the Petitioner is summarized in the following table:

Table 23 : Approved Capital Cost for Ghanvi-II SHP (Rs. Crores)

Particular	Cost as per DPR	Cost as per Petition	Cost as per Auditor Certificate	Approved Cost
Preliminary	0.49	0.57	0.57	0.57
Land	0.36	0.82	1.71	1.71
Civil Works	20.97	48.13	82.17	38.27
Cultivated land	0.003	0.00	0.00	0.00
Audit and accounts charges	0.23	0.00	0.00	0.00
Electrical work	18.16	32.41	31.41	29.49
Transmission	1.17	3.37	3.03	3.03
Establishment	2.51	37.51	0.00	7.85
Contingency	0.00	1.07	0.00	0.00
Departmental Charges	0.00	10.84	10.70	1.07
Interest During Construction	3.35	42.65	26.98	18.76
Grand Total	48.20	180.58	156.58	100.74

Capital Structure

4.56 The normative Debt: Equity ratio as per Regulation 22 of the HPERC RE Regulations 2012 is 70:30. Actual funding pattern claimed by the Petitioner is 49% from Debt, 46% from equity and 5% from capital subsidy.

- 4.57 The Petitioner provided copy of loan agreements for which an initial loan of Rs. 34.15 Crores was approved by REC for the project on 1-Jan-2004. Thereafter additional loan for Rs. 55.66 Crores was sanctioned by REC on 27-Jul-2010, taking the total loan amount to Rs. 89.81 Crores.
- 4.58 Further, the Petitioner informed that Rs. 15.12 Crores of equity was provided by GoHP and rest of the equity claimed was arranged from the other loans from the Banks/FIs and internal accruals of the Company.
- 4.59 The Commission observed that the equity amount against Ghanvi-II SHP as per Audited Accounts of HPSEB is Rs. 15.12 Crores. In response to a query of the Commission, the Petitioner also provided the break-up of Rs. 15.12 Crores of equity infusion received from the GoHP.
- 4.60 Accordingly, the Commission has approved Rs. 15.12 Crores of equity received from GoHP for Ghanvi-II SHP. The normative debt amount is then calculated as difference of total capital cost allowed less the amount of equity allowed, as follows:

Table 24 : Approved Capital Structure for Ghanvi-II SHP (Rs. Crores)

Particular	Amount
Total Capital Cost	100.74
Equity	15.12
Debt	85.62

- 4.61 Also, as per the submission of the Petitioner, Capital Subsidy of Rs. 11.25 Crores was approved for project by the Ministry of New and Renewable Energy (MNRE), the treatment of which is considered as per Regulation 21(1) of HPERC RE Regulations 2012, as discussed in detail under chapter 'Determination of Tariff' of this Order.

Additional Capitalization

- 4.62 The Petitioner as part of its subsequent communications in response to the queries of the Commission, furnished an Auditor Certificate for an additional capital expenditure of Rs. 2.81 Crores incurred post COD, with following year on year breakup:

Table 25 : Additional Capitalization (Rs. Crore)

Particulars of cost	2015-16	2016-17
Civil construction cost	0.04	2.49
Misc. expenditure	0.00	0.27
Total	0.05	2.76

- 4.63 As certified by the Auditor, the Commission has considered this additional capitalization, and capitalized the same in their respective year during the tariff period.
- 4.64 Considering that Equity from GoHP is limited to Rs. 15.12 Crores, as verified against documentary evidence and accounts of HPSEB, the Commission has considered the additional capitalization to be funded entirely by loan.

5. DETERMINATION OF TARIFF

Background

- 5.1 Based on the approved Capital Cost of Ghanvi-II SHP in this Order, Project Specific Levelised Tariff is determined for the project in accordance with HPERC RE Regulations 2012.
- 5.2 Project Specific Levelised Tariff is determined for the project, for a period of 40 years useful life, in accordance with Regulation 12 and 2(aa) of the HPERC RE Regulations 2012, from the date of commencement of generation i.e. 03-Apr-2014.

Net Saleable Energy

Gross Energy

- 5.3 Regulation 14(ii) of the HPERC RE Regulations 2012, provides for determination of project specific levelized tariff using gross energy based on capacity utilization factor on the basis of data for 75% dependable year, as per the approved Detailed Project Report.
- 5.4 However, the Petitioner has requested to consider the average actual generation for last five years (excluding FY 2017-18) for computation of levelized tariff. The actual generation for the FY 2017-18 is not considered in the average, since it is low due to shutdown activity. It has claimed average actual generation of 39.75 MU during the period of FY2013-14 to FY2018-19 (excluding FY 2017-18), as follows:

Table 26 : Year wise Gross Generation, claimed by Petitioner

Year	Gross Generation (MUs)
2013-14	3.72
2014-15	38.51
2015-16	44.82
2016-17	39.51
2017-18	23.46
2018-19	36.17

- 5.5 As per the DPR of Ghanvi-II SHP project, the Design Energy at 75% dependable year is 56.3 MU per annum. In accordance with Regulation 14(ii) of the HPERC RE Regulations 2012, the Commission has used 56.3 MUs of Gross Energy as per DPR, for tariff determination.

Auxiliary consumption and Transformation Loss

- 5.6 Regulation 36 of HPERC RE Regulations 2012, provides for 0.5% of Gross Generation as Auxiliary Consumption and 0.5% of Gross Generation as Transformation losses.

- 5.7 The Petitioner has claimed in its Petition, Auxiliary consumption and Transformation Loss of 0.83%, as follows:

Table 27: Aux. consumption and transformation loss, claimed by Petitioner

Year	Auxiliary consumption (%)	Transformer Losses (%)	Total
2014-15	0.24%	0.90%	1.14%
2015-16	0.18%	0.61%	0.79%
2016-17	0.21%	0.72%	0.93%
2017-18	0.21%	0.53%	0.74%
2018-19	0.19%	0.35%	0.54%
Average (last 5 years)			0.83%

- 5.8 However, the Commission has considered 1% (0.5% towards Auxiliary Consumption and 0.5% as Transformation losses) in line with Regulation 36 of the HPERC RE Regulations 2012.

Free power to GoHP and LADF

- 5.9 Regulation 35(3) of the HPERC RE Regulations 2012, provides for 13% free power, as follows:

"The free energy to be taken into account for any part of the tariff period for the purposes of sub-regulation (1), or to be allowed for any part of the tariff period for the purposes of sub-regulation (2), shall not exceed 13% free power(energy) which includes 12% free power to home State and 1% additional free power for Local Area Development Fund, as stipulated in the National Hydro Policy/ Tariff Policy".

- 5.10 The Petitioner has also used 13% of free power in its petition for calculation of net saleable energy, in accordance with HPERC RE Regulations 2012.
- 5.11 Based on the figures for Gross Energy, Auxiliary Consumption, Transformation Losses and Free Power, in accordance with Regulation 35(3) of the HPERC RE Regulations 2012, the net saleable energy annually for Ghanvi-II SHP is worked out as follows:

Table 28 : Approved Net Saleable Energy

Units Generation	Unit	Generated Units
Installed Capacity	MW	10
Net Generation @75% dependable year	MU	56.30
Auxiliary Consumption @ 0.50%	MU	0.28
Net After Aux Consumption	MU	56.02
Transformation Losses @ 0.50%	MU	0.28

Units Generation	Unit	Generated Units
Net after Transformation Losses	MU	55.74
Royalty and LADF@ 13%	MU	7.25
Net Saleable Energy	MU	48.49

Subsidy by MNRE

- 5.12 Regulation 21(1) of HPERC RE Regulations 2012, provides for adjustment of 90% capital subsidy amount received by a project, as additional loan repayment for tariff determination as follows:

“While determining the generic levelized or project specific levelized tariff, as the case may be, for the renewable energy project(s) under these Regulations, the Commission shall take into consideration any incentive and/or subsidy and/or grant available under the schemes of the Central or State Government or its agencies, including accelerated depreciation benefit under the Income Tax Act.

*Provided that for tariff determination, **90% of the capital subsidy** available to the project as per applicable scheme of the MNRE/ State Government shall be considered.*

.....

*Provided further that the capital subsidy under the schemes of the Central or State Government or its agencies, shall, unless the circumstances otherwise warrant, be ordinarily **adjusted against the principal component of the loan amount as additional reduction apart from the normal payment.**”*

- 5.13 The Commission asked the Petitioner to furnish details of subsidy received by the Project. The Petitioner submitted that a subsidy of Rs.8.46 Crores was received from MNRE. Also, the Petitioner clarified that actual approved subsidy from MNRE was Rs 11.25 Crores, however due to delay in taking certificate of performance from AHEC and submission of audited statement of expenditure for the project by HPSEBL, only Rs 8.46 Crores of subsidy was released by MNRE.
- 5.14 Considering that the difference between the subsidy amount approved and the subsidy amount actually released was on account of negligence on part of the Petitioner, the Commission has adjusted 90% of the subsidy grant approved, i.e. Rs 11.25 Crores, in tariff determination, as per Regulation 21 of HPERC RE Regulations 2012.

O&M Expense

- 5.15 Regulation 27 of the HPERC RE Regulations 2012 provide for normative O&M expenses with escalation as follows:

“....

*(2) Operation and maintenance expenses shall be determined for the tariff period based on **normative operation and maintenance expenses** specified in Chapter-V of these Regulations for the SHPs and as stipulated in relevant orders of the Commission for other renewable technologies.*

*(3) Normative O&M expenses allowed under these Regulations shall be **escalated at the rate of 5.72% per annum** over the tariff period."*

- 5.16 Further Regulation 38 of the HPERC RE Regulations 2012, provides for normative O&M expenses of Rs. 18 Lakhs per MW, for SHPs of capacity 5 MW to 25 MW.
- 5.17 The Petitioner has claimed in its petition base year O&M costs of Rs. 18 Lakh per MW with an escalation of 5.72% per annum as per the norms of HPERC RE Regulations, 2012. However, the Petitioner has escalated the normative O&M cost twice for arriving at base year of COD (03-Apr-2014) i.e. FY2014-15, as Rs 20.12 Lakh per MW for the first year of tariff.
- 5.18 In accordance with Regulation 27 of the HPERC RE Regulations 2012, the Commission has used normative O&M for base year of Rs. 18 Lakhs per MW, in the first year of Tariff Period, as the regulations prescribe the benchmark O&M expense for first year of operation and post which the escalation shall apply during the tariff period.

Depreciation

- 5.19 Regulation 24 of HPERC RE Regulations 2012, provides for depreciation at the rate of 5.83% till such time requirement for repayment of loan component (after adjusting for subsidy) is fulfilled, and at straight line method thereafter for the remaining period of the useful life which is reproduced as under:-
- "24. For the purpose of tariff determination, depreciation shall be computed in the following manner, namely:
- (b) the salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset;
- (c) *Depreciation per annum shall be based on 'Differential Depreciation Approach'. For tariff purposes, the depreciation shall be allowed @ 5.83 % per annum till such time the requirement for repayment of loan component of the capital cost as per regulations 20, 22 and 23 after adjusting the amount of subsidy as per regulation 21, is fully provided and the remaining depreciation shall be spread over the residual useful life of the project on straight line method"*.
- 5.20 The Commission has adopted the approach for depreciation as per Regulation 24 of the HPERC RE Regulations 2012, as also followed by the Petitioner for calculation of tariffs in its petition.

Interest on Term Loan

5.21 Regulation 23(2)(b) of HPERC RE Regulations 2012 (amended in Feb 2015), provides for normative interest rate as follows:

"23(2)(b) Provided that where tariff is to be determined on financial year basis, in the control period, the Average Base Rate(s) of the State Bank of India (SBI) prevalent during the first six months of the previous year plus 300 basis points, shall be considered as the normative interest rate."

5.22 As per Regulation 23(2)(b) of the HPERC RE Regulation 2012, the normative interest rate works out to be 12.71%, based on 6 months period of 1-Apr-2013 to 30-Sep-2013, as follows:

Table 29 : Normative interest rate for term loan as per SBI Base Rate

Effective Date (start)	Effective Date (end)	SBI Base Rate	Applicable Days
1-Apr-2013	19-Sep-2013	9.70%	171
20-Sep-2013	30-Sep-2013	9.80%	11
Weighted Average SBI Base Rate			9.71%
Margin			3.00%
Normative interest rate for term loan			12.71%

5.23 The Petitioner has claimed actual weighted average interest on term loan rate of 11.61%, supported by actual loan disbursement schedule as documentary evidence.

5.24 The Commission has taken the lower of the actual Weighted Average. interest rate and normative interest rate. Accordingly, interest on term loan is calculated using interest rate of 11.61%.

5.25 Further the Commission has worked out the schedule for normative loan repayment and interest on loan basis following considerations:

- Loan amount of Rs. 85.62 Crores is taken as opening balance, as per approved Capital Cost and Capital Structure by the Commission in this Order.
- Loan repayment is made equal to depreciation as per Regulation 23(c) of the HPERC RE Regulations 2012.

"23(c) Notwithstanding any moratorium period availed by the renewable energy generator, the repayment of loan shall be considered from the first year of the tariff period and shall be equal to the annual depreciation allowed."

- As discussed in paras 5.13 and 5.14 above, the Petitioner has availed capital subsidy of Rs. 8.46 Crore from MNRE against the Ghanvi II HEP. On scrutiny of the documents, it was observed that the Petitioner was eligible for a subsidy of Rs. 11.25 Crore against the project from MNRE. Justification for reduced amount of subsidy considered Rs. 8.46 Cr. was sought from the Petitioner In response, the Petitioner submitted that MNRE, Govt of India has released the subsidy/ grant in 3 equal instalments amounting to Rs. 281.25 Lakhs each i.e. total Rs. 843.75 Lakhs to HPSEBL. However, the fourth instalment could not be released by MNRE due to delay in taking certificate of performance from AHEC and audited statement of expenditure of the project. The Commission is of the view that the Petitioner had failed to take appropriate diligence with respect to availing the subsidy due towards the project. The impact of such negligence on part of Petitioner cannot be passed to the consumers. The Commission has accordingly considered the complete amount of subsidy due towards the project i.e. Rs. 11.25 Crores for tariff determination.
- In accordance with Regulation 21(1) of the HPERC RE Regulations 2012, 90% of the capital subsidy is reduced as additional loan repayment in the first year which is as under:-

*"21(1) Provided that for tariff determination, **90% of the capital subsidy** available to the project as per applicable scheme of the MNRE/ State Government shall be considered.*

*..... Provided further that the capital subsidy under the schemes of the Central or State Government or its agencies, shall, unless the circumstances otherwise warrant, be ordinarily **adjusted against the principal component of the loan amount as additional reduction apart from the normal payment.**"*

- Additional loan required on account of Rs. 2.81 Crores of Additional Capitalization allowed by the Commission, is added to the loan schedule in the respective year of additional capitalization.

Table 30: Loan schedule as approved by the Commission (Rs. Crores)

Particular	1	2	3	4	5	6	7
Opening Balance	85.62	69.63	63.81	60.61	54.57	48.53	42.49
Addition	0.00	0.05	2.76	0.00	0.00	0.00	0.00
Repayment	5.87	5.87	5.96	6.04	6.04	6.04	6.04
Additional payment (from capital subsidy)	10.13	-	-	-	-	-	-
Closing Balance	69.63	63.81	60.61	54.57	48.53	42.49	36.45
Average of Opening and Closing balance	77.62	66.72	62.21	57.59	51.55	45.51	39.47
Interest Rate	11.61%	11.61%	11.61%	11.61%	11.61%	11.61%	11.61%
Interest	9.01	7.75	7.22	6.69	5.98	5.28	4.58

Particular	8	9	10	11	12	13	14
Opening Balance	36.45	30.41	24.37	18.33	12.29	6.25	0.21
Addition	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Repayment	6.04	6.04	6.04	6.04	6.04	6.04	0.21
Additional payment (from capital subsidy)	-	-	-	-	-	-	-
Closing Balance	30.41	24.37	18.33	12.29	6.25	0.21	0.00
Average of Opening and Closing balance	33.43	27.39	21.35	15.31	9.27	3.23	0.11
Interest Rate	11.61%	11.61%	11.61%	11.61%	11.61%	11.61%	11.61%
Interest	3.88	3.18	2.48	1.78	1.08	0.38	0.01

Interest on Working Capital

5.26 Regulation 26(1) of the HPERC RE Regulations 2012, provides for calculation of normative interest on working capital as follows:

"26. Interest on working capital

(1) *The working capital requirement in respect of wind energy projects, small hydro power, solar PV and solar thermal projects shall be computed in accordance with the following:-*

- a) *operation and maintenance expenses for one month;*
- b) *receivables equivalent to 2 (two) months of energy charges for sale of electricity calculated on the net saleable energy corresponding to the CUF considered for tariff determination on normative basis;*
- c) *maintenance spare @ 15% of operation and maintenance expenses."*

5.27 The Commission has adopted the approach for calculation of interest on working capital as per Regulation 26(1) of the HPERC RE Regulations 2012, as also followed by the Petitioner for calculation of tariffs in its petition.

5.28 Further normative rate of interest for Interest on Working Capital is taken as per Regulation 26(4) of the HPERC RE Regulations 2012 (amended in Feb 2015), as follows:

"26(4) Provided that in cases where tariff is to be determined on financial year basis, in the control period, the Average Base Rate(s) of the State Bank of India (SBI) prevalent during the first six months of the previous year plus 350 basis points, shall be considered as the normative interest rate."

5.29 As per Regulation 26(4) of the HPERC RE Regulation 2012, the normative interest rate for working capital loan works out to be 13.21%, based on 6 months period of 1-Apr-2013 to 30-Sep-2013, as follows:

Table 31 : Normative interest rate for working capital loan as per SBI Base Rate

Effective Date (start)	Effective Date (end)	SBI Base Rate	Applicable Days
1-Apr-2013	19-Sep-2013	9.70%	171
20-Sep-2013	30-Sep-2013	9.80%	11
Wtd. Avg. SBI Base Rate			9.71%
Margin			3.50%
Normative interest rate for working capital loan			13.21%

Return on Equity (RoE)

- 5.30 As per Capital Cost and Capital Structure approved by the Commission in this Order, RoE is allowed for the project, for Equity amount of Rs. 15.12 Crores.
- 5.31 The Commission has calculated RoE (on pre-tax basis), in accordance with Regulation 25(2) of HPERC RE Regulations 2012, at 19% per annum for first 10 years and 22% per annum from 11th year onwards, as also adopted by the Petitioner in its petition for tariff determination.

"25. Return on Equity

.....

(2) The normative return on Equity shall be -

(a) 19% per annum for the first 10 years.

(b) 22% per annum from 11th year onwards."

Levelized Tariff

- 5.32 Based on the approved Capital Cost of the project as discussed above and various operational/ financial parameters as detailed in this Order, the Commission has calculated the tariff for each year of the useful life of the plant i.e. 40 years.
- 5.33 The year-on-year tariffs are then converted into a Levelised Tariff using WACC as Discount Rate. Discount Rate of 9.21% has been calculated as per Regulation 11(4) of HPERC RE Regulations 2012, basis:
- Both Debt and Equity rates have been adjusted for tax, in accordance with methodology adopted by the Commission in its previous Generic Tariff Orders (HPERC Tariff Order for Determination of generic levelised tariffs for Small Hydro Projects dated 20.05.2013) for SHPs.
 - The Tax rate is considered as MAT rate of 18.5% for first 10 years and Corporate Tax of 30% thereafter, both adjusted for surcharge of 5% and cess of 3%.

- 5.34 The parameters considered by the Commission to determine the levelized tariff for power generated from the Petitioner’s hydro power project have been summarized in the table below:

Table 32 : Summary of parameters considered for tariff determination

Parameter	Unit	Amount/ Value
Capital Cost		
Approved Capital Cost	Rs. Crores	100.74
Debt	Rs. Crores	85.62
Equity	Rs. Crores	15.12
MNRE Subsidy	Rs. Crores	11.25
% of subsidy adjusted in tariff	%	90.00%
Additional Capitalization	Rs. Crores	2.81
Capacity and Energy		
Design Energy as per DPR (75% Dependable Year)	MU	56.30
Auxiliary Consumption	%	0.50%
Transformation Losses	%	0.50%
Useful Life	Years	40
Royalty and LADF	%	13.00%
Interest on Term Loan		
Interest Rate (actual weighted average)		11.61%
Return on Equity		
Return on Equity for first 10 years (pre-tax)	% p.a	19.00%
Return on Equity 11th year onwards (pre-tax)	% p.a	22.00%
Depreciation		
During loan repayment period	%	5.28%
For remaining years	Method	SLM
Interest on Working Capital		
Working capital requirement:		
O&M Charges	Months	1.00
Maintenance Spare	% of O&M	15%
No. of months of Receivables of energy charges	Months	2.00
Normative Interest Rate for Working Capital	%	13.21%
O&M Expense		
Base Year	Rs Cr./MW	0.18
Escalation Rate	%	5.72%
Discount Rate	%	9.21%

- 5.35 Based on approved Capital Cost of Rs. 100.74 Crores plus additional capitalization of Rs. 2.81 Crores, and on the basis of approach/ assumptions discussed in this Order, the Commission determines a **Project Specific Levelised Tariff of Rs. 3.16 per kwh** for Ghanvi-II SHP, to be made applicable from the date of COD i.e. 03-Apr-2014.

Accelerated Depreciation

5.36 The Commission has also determined tariff, by considering the benefit of Accelerated Depreciation, in accordance with Regulation 21(4) of the HPERC RE Regulations, 2012, which is reproduced hereunder.

"26(4) The Commission shall determine two generic levelled tariffs or project specific levelled tariffs, as the case may be, one by considering accelerated depreciation and the other without it, and the tariff to any renewable energy generator shall be applicable as provided in succeeding sub-regulation(5) ..."

5.37 The Commission has calculated the accelerated depreciation benefit on the following basis:

- 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 rate i.e. 80% of the written down value method.
- The tax benefit on this account has been computed at applicable Income Tax rate @32.445% (30% IT rate +5% surcharge +3% education cess).
- This Net Tax Benefit is converted into per unit benefit by dividing with net saleable energy for the year.
- This Net Tax Benefit is levelized using discount factor of 9.29%, as determined in earlier sub-sections of the Order.

5.38 The Levelised Benefit due to Accelerated Depreciation comes out to be as follows:

Table 33 : Levelised Benefit due to Accelerated depreciation

Parameter	Unit	Amount/ Value
Levelised Tariff (without Accelerated Depreciation)	Rs./Kwh	3.16
Impact of Accelerated Depreciation	Rs./Kwh	0.24
Levelised Tariff (with Accelerated Depreciation)	Rs./Kwh	2.92

5.39 While the Petitioner has not claimed Accelerated Depreciation benefit in its Tariff Petition, the impact as calculated by the Commission may be considered, if applicable, in accordance with the provisions of HPERC RE Regulations, 2012.

Sd/-	Sd/-	Sd/-
(YASHWANT SINGH CHOGAL)	(BHANU PRATAP SINGH)	(DEVENDRA KUMAR SHARMA)
Member	Member	Chairman

Approved Tariff for Ghanvi-II SHP

Units Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Installed Capacity	MW	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Gross Generation	MU	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30
Auxiliary Consumption	MU	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Net After Aux Consumption	MU	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02
Transmission Losses	MU	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Net after Trans. Losses	MU	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74
Royalty and LADF	MU	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25
Net Saleable Energy	MU	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49
Tariff Components	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M Expenses	Rs. Cr.	1.80	1.90	2.01	2.13	2.25	2.38	2.51	2.66	2.81	2.97	3.14	3.32	3.51	3.71	3.92	4.15	4.38	4.63	4.90	5.18
Depreciation	Rs. Cr.	5.87	5.87	5.96	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	6.04	0.35	0.35	0.35	0.35	0.35	0.35
Interest on term loan	Rs. Cr.	9.01	7.75	7.22	6.69	5.98	5.28	4.58	3.88	3.18	2.48	1.78	1.08	0.38	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs. Cr.	0.50	0.47	0.47	0.47	0.46	0.45	0.44	0.43	0.42	0.42	0.42	0.41	0.41	0.41	0.29	0.31	0.32	0.33	0.35	0.36
Return on Equity (pre-tax)	Rs. Cr.	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	2.87	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33
Total Fixed Cost	Rs. Cr.	20.06	18.87	18.53	18.19	17.60	17.02	16.44	15.88	15.32	14.77	14.70	14.17	13.66	13.50	7.89	8.13	8.38	8.64	8.92	9.22
Generation Tariff	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
O&M expenses	Rs/kWh	0.37	0.39	0.41	0.44	0.46	0.49	0.52	0.55	0.58	0.61	0.65	0.68	0.72	0.76	0.81	0.85	0.90	0.96	1.01	1.07
Depreciation	Rs/kWh	1.21	1.21	1.23	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	1.24	0.07	0.07	0.07	0.07	0.07	0.07
Int. on term loan	Rs/kWh	1.86	1.60	1.49	1.38	1.23	1.09	0.94	0.80	0.66	0.51	0.37	0.22	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.10	0.10	0.10	0.10	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08	0.06	0.06	0.07	0.07	0.07	0.07
RoE	Rs/kWh	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.59	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Tariff	Rs/kWh	4.14	3.89	3.82	3.75	3.63	3.51	3.39	3.27	3.16	3.05	3.03	2.92	2.82	2.78	1.63	1.68	1.73	1.78	1.84	1.90
Discount Factor	Ratio	1.00	0.92	0.84	0.77	0.70	0.64	0.59	0.54	0.49	0.45	0.41	0.38	0.35	0.32	0.29	0.27	0.24	0.22	0.20	0.19
Net value of tariff	Rs/kWh	4.14	3.56	3.20	2.88	2.55	2.26	2.00	1.77	1.56	1.38	1.25	1.11	0.98	0.88	0.47	0.45	0.42	0.40	0.38	0.36
Levelized Tariff	Rs/kWh	3.16																			

Units Generation	Unit	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Installed Capacity	MW	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00
Gross Generation	MU	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30	56.30
Auxiliary Consumption	MU	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Net After Aux Consumption	MU	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02	56.02
Transmission Losses	MU	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Net after Trans. Losses	MU	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74	55.74
Royalty and LADF	MU	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25	7.25
Net Saleable Energy	MU	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49
Tariff Components	Unit	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
O&M Expenses	Rs. Cr.	5.48	5.79	6.12	6.47	6.84	7.23	7.64	8.08	8.54	9.03	9.55	10.10	10.67	11.28	11.93	12.61	13.33	14.10	14.90	15.75
Depreciation	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
Interest on term loan	Rs. Cr.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on working Capital	Rs. Cr.	0.38	0.40	0.41	0.43	0.45	0.47	0.50	0.52	0.54	0.57	0.60	0.63	0.66	0.69	0.73	0.76	0.80	0.84	0.89	0.93
Return on Equity (pre-tax)	Rs. Cr.	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33
Total Fixed Cost	Rs. Cr.	9.53	9.86	10.21	10.58	10.97	11.38	11.82	12.28	12.76	13.28	13.82	14.40	15.01	15.65	16.33	17.05	17.81	18.62	19.47	20.36
Generation Tariff	Unit	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
O&M expenses	Rs/kWh	1.13	1.19	1.26	1.33	1.41	1.49	1.58	1.67	1.76	1.86	1.97	2.08	2.20	2.33	2.46	2.60	2.75	2.91	3.07	3.25
Depreciation	Rs/kWh	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Int. on term loan	Rs/kWh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Int. on working capital	Rs/kWh	0.08	0.08	0.09	0.09	0.09	0.10	0.10	0.11	0.11	0.12	0.12	0.13	0.14	0.14	0.15	0.16	0.17	0.17	0.18	0.19
RoE	Rs/kWh	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69	0.69
Tariff	Rs/kWh	1.97	2.03	2.11	2.18	2.26	2.35	2.44	2.53	2.63	2.74	2.85	2.97	3.09	3.23	3.37	3.52	3.67	3.84	4.01	4.20
Discount Factor	Ratio	0.17	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.08	0.07	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03
Net value of tariff	Rs/kWh	0.34	0.32	0.30	0.29	0.27	0.26	0.25	0.23	0.22	0.21	0.20	0.19	0.18	0.18	0.17	0.16	0.15	0.15	0.14	0.13

Accelerated Depreciation

Units Generation	Unit	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Depreciable value	Rs. Cr.	93.20																				
Book Dep. @5.28%	Rs. Cr.	5.32	5.32	5.39	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	5.47	0.62	0.00	0.00	
Accelerated Depreciation																						
Opening	%	100%	20%	4.00%	0.80%	0.16%	0.03%	0.01%	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%	
Allowed during year	%	80%	16%	3.20%	0.64%	0.13%	0.03%	0.01%	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%	
Closing	%	20%	4%	0.80%	0.16%	0.03%	0.01%	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%	
Accelerated Depreciation	Rs. Cr.	74.56	14.91	2.98	0.60	0.12	0.02	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	
Net Depreciation Benefit	Rs. Cr.	69.24	9.59	-2.41	-4.87	-5.35	-5.44	-5.46	-5.47	-5.47	-5.47	-5.47	-5.47	-5.47	-5.47	-5.47	-5.47	-5.47	-0.62	0.00	0.00	
Tax Rate		32.45%																				
Tax Benefit	Rs. Cr.	22.47	3.11	-0.78	-1.58	-1.74	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-1.77	-0.20	0.00	0.00	
Net Saleable Energy	MUs	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	
Tax Benefit	Rs./kwh	4.63	0.64	-0.16	-0.33	-0.36	-0.36	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.37	-0.04	0.00	0.00	
Discount Factor	Ratio	1.00	0.92	0.84	0.77	0.70	0.64	0.59	0.54	0.49	0.45	0.41	0.38	0.35	0.32	0.29	0.27	0.24	0.22	0.20	0.19	
Levelised Tax Benefit	Rs./kwh	0.24																				

Units Generation	Unit	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Book Dep. @5.28%	Rs. Cr.	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
Accelerated Depreciation																					
Opening	%	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%
Allowed during the year	%	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%
Closing	%	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%
Accelerated Depreciation	Rs. Cr.	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
Net Depreciation Benefit	Rs. Cr.	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
Tax Rate		32.45%																			
Tax Benefit	Rs. Cr.	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
Net Saleable Energy	MUs	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49	48.49
Tax Benefit	Rs./kwh	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
Discount Factor	Ratio	0.17	0.16	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.08	0.07	0.06	0.06	0.05	0.05	0.05	0.04	0.04	0.03	0.03