

Analysis of ARR & Tariff Proposal of OHPC for FY 2022-23

World Institute of Sustainable Energy, Pune
Consumer Counsel

Presentation Outline

- Installed capacity, NAPAF and design energy
- Project cost
- Components of annual fixed cost
- ARR and Tariff

Installed Capacity and Design Energy

Installed Capacity of OHPC Stations and NAPAF



- Total installed capacity of OHPC owned hydro station is **2093.65** MW (**2033.60** MW from OHPC hydro power plant + **60** MW from share of Machhkund). After completion of RM & U works of Unit-6 of HHEP, Burla it was uprated from 37.5MW to 43.65MW.
- The Commission in its order dated 20.03.2020 vide case no. 52 of 2019 has re-determined NAPAF of OHPC Stations for the control period from 01.04.2019 to 31.03.2024 for recovery of Capacity Charges.

Power Stations	RHEP	UKHEP	BHEP	HHEP	CHEP	UIHEP
Approved for 2019-24 block period	80	87	83- for first 3 years, 87 – for next 2 years	75	75	88
OERC approval for FY 21-22	80	87	83	75	75	88
OHPC proposed for FY 22-23	80	87	87	75	75	88

Design Energy vs Actual/Anticipated Generation in FY 2021-22

Name of HEP	Commission approval for FY 2021-22 (MU)	Reservoir Level and Generation for FY 2021-22		Reservoir Level and Generation for FY 2020-21		Increase in generation in FY 2021-22 over FY 2020-21
		Reservoir level as on 15 Nov 2021	Anticipated generation (MU)	Reservoir level as on 15 Nov 2020	Actual generation (MU)	
RHEP	519.75	122.33 mtr.	1078.51	120.41m	980.77	9.97%
UKHEP	823.68	851.76 mtr.	470.31	852.74 m	771.26	-39.02%
BHEP	1171.17	1483.80 ft.	1102.51	1502.00 ft	1594.30	-30.85%
HHEP	677.16	629.23 ft.	691.98	627.87 ft	597.39	15.83%
CHEP	485.10		253.55		322.37	-21.35%
UIHEP	1942.38	631.31mtr	1137.00	637.56 m	1713.10	-33.63%
SubTotal of old power stations	5619.24		4734.47		5979.19	-20.82%

Note: The reservoir level as on Nov 2021 are noted to be low (Except RHEP, HHEP) compare to the level recorded as on Nov 2020; also, anticipated generation for FY 2021-22 is projected to be lower than FY 2020-21 by around 20%. Honourable Commission may review the same. If the factors behind the increase are controllable, then the tariff may be set accordingly.

Project Cost

Proposed Project Cost for ARR 2022-23 (Rs. Cr)



Name of power station	Historic cost as on 01.04.1996	Asset reduction during FY 2011-12 to FY 2020-21	New additions from 01.04.1996 to 31.03.2020 (Approved)	New additions during FY 2020-21 (Audited as per IND-AS)	Less PSDF Grant for FY 2020-21	New additions proposed in tariff calculation FY 2022-23	Project cost considered Tariff calculation FY 2022-23 based on Historic Cost	Project cost approved for 2021-22 for Tariff calculation based on Historic Cost
1	2	3	4	5	6	7=4+5-6	8=2+7-3	9
RHEP	91.09	0.09	61.400	5.034	3.133	63.30	154.30	152.40
UKHEP	108.31	0.49	27.150	0.684	0.000	27.83	135.65	134.97
BHEP	115.42	0.53	224.490	3.214	1.243	226.46	341.35	339.38
HHEP	72.75	11.51	265.910	18.523	0.557	283.88	345.11	327.15
CHEP	92.23	6.928	51.740	68.617	0.565	119.79	205.09	142.69
Sub Total	479.80	19.556	630.690	96.072	5.497	721.264	1181.51	1096.59
UIHEP	1194.79	4.91	55.990	2.946	2.31	56.63	1246.51	1245.87
Total	1674.59	24.468	686.68	99.018	7.803	777.90	2428.02	2342.45

Proposed Project Cost for ARR 2022-23

Observations



- OHPC has considered the historical cost of its power stations as on 01.04.1996 plus new capitalization and decapitalization after 01.04.1996 up to FY 2020-21 for computation of tariff for FY 2022-23.
- Already approved additional capitalization is Rs 686.68 Cr, and additional Rs 91.215 Cr (in FY 20-21) is claiming for tariff determination of FY 2022-23. OHPC utilized the PSDF grant of Rs 7.80 Crs, hence, deducted from additional capitalization. Addition in HHEP, CHEP may be reviewed as per the OERC Generation Regulations.
- Historical cost Rs. 1674.59 Cr., new addition Rs. 777.90 Cr. and decapitalization Rs. 24.468Cr. have been considered for Project cost of Rs. 2428.02 Cr for tariff calculation.

Components of Annual Fixed Cost

- Return on Equity
- Interest on Loan
- Depreciation
- Operation and Maintenance
- Interest on Working Capital

Return on Equity (Amt in Cr)

Name of the Power Station	Capital Addition considered for RoE for FY 2022-23 (in Crs)	Share of Equity (%)	Value of Equity capital (in Crs)	ROE Proposed for 2022-23 (in Crs)	RoE approved by OERC for 2021-22 (in Crs)
1	2	3	4=2*3	5=15.5 or 16% of 4	6
RHEP	63.30	30	18.990	2.944	2.855
UKHEP	27.83	30	8.350	1.294	1.263
BHEP	226.46	30	67.938	10.530	10.439
HHEP	283.88	30	85.163	13.200	12.365
CHEP	119.79	30	35.938	5.570	2.406
UIHEP	1246.51	25&30	314.459	50.313	50.283
Total	1967.77		530.839	83.852	79.610

Para 189 of TO FY 21-22: *The Commission scrutinized the PPA of the OHPC plants and it is found that for old plants the Return on Equity is 15.5% and for UIHEP the RoE is 16%.*

Interest on Normative Loan (FY 2022-23) Proposal



(In Rs.
Cr.)

Item	RHEP	UKHEP	BHEP	HHEP	CHEP	UIHEP	Total
Normative Loan							
Average outstanding principal	5.94	3.82	3.90	21.97	42.67	14.907	58.436
Normative Loan Interest rate (%)	9.8	9.8	9.6	8.75	9.8	7	-
Interest Amount (Rs. Cr.) FY 22-23	0.58	0.374	0.37	1.92	4.18	1.043	8.478
Approved Interest Amount (Rs. Cr.) FY 2021-22	0.854	0.446	0.383	1.590	0.171	1.522	4.968
Government loan							
Interest Amount (Rs. Cr.) FY 22-23	-	-	-	-	-	-	-
Approved Interest Amount (Rs. Cr.) FY 2021-22	-	-	-	-	-	-	-
Total Interest claimed (Normative Loan+ Govt Loan) FY 2022-23	<u>0.583</u>	<u>0.374</u>	<u>0.374</u>	<u>1.922</u>	<u>4.182</u>	<u>1.043</u>	<u>8.478</u>

Interest on Loan : Observations and Submission



- OHPC has not considered interest on government loan and normative loan of UIHEP for FY 2022-23 as per the directives of Hon'ble Commission in previous orders. Cumulative interest of these two loans is also not claimed.
- State government had suggested to include both payment of interest and repayment of principal in the ARR of UIHEP and to consider past interest as regulatory asset, to be paid in future tariff. Hon'ble Commission has opined to consider accumulated interest on govt. loan and normative loan of UIHEP in ARR after completion of principal repayment.
- The normative loans of CHEP, RHEP & UKHEP is considered @ 9.8% as per Clause No. 22 of OERC (Terms & Conditions for determination of Generation Tariff) Regulation, 2020. The normative loan of BHEP, Balimela and HHEP, Burla is considered based on PFC interest rate. The Normative loan of UIHEP is considered @7% being the prevailing rate of interest for State Govt. Loan.

Depreciation, O&M and IoWC : Proposal

(Rs. in Crore)

Power Station	Depreciation Claimed		O&M Expenses		Interest on Working Capital	
	Approved for FY 2021-22	Proposed for FY 2022-23	Approved for FY 2021-22	Proposed for FY 2022-23	Approved for FY 2021-22	Proposed for FY 2022-23
RHEP	3.92	4.29	59.84	63.262	2.434	2.382
UKHEP	3.47	3.49	62.30	65.863	2.495	2.443
BHEP	8.72	8.77	57.73	61.035	2.515	2.450
HHEP	8.41	9.31	64.61	68.303	2.822	2.771
CHEP	3.67	5.27	30.20	31.927	1.260	1.340
Sub Total	28.19	31.13	274.68	290.390	11.526	11.386
UIHEP	32.02	43.01	101.15	106.93	4.750	4.674
Total	60.20	74.15	375.82	397.32	16.276	16.060

Depreciation :Observations and Submission

- ❑ OHPC has computed depreciation for FY 2022-23 @ 2.57% of historic project cost as on 01.04.1996 plus additional capitalization. The unit wise depreciation so calculated has been compared with loan repayment and whichever is higher has been considered as depreciation.
- ❑ OHPC in the present tariff application has claimed the differential amount of depreciation amounting to Rs 5.59 Crs for the FY 2021-22 along with the normal depreciation of Rs 68.56 Crs for FY 2022-23, applying previously approved norms of Hon'ble Commission, total amounting to Rs 74.15 Crs.
- ❑ Depreciation may only be approved after due scrutiny of loan repayment of different plants of OHPC.

O& M expenses : Observations and Submission



- OHPC has claimed expenses on O&M following clause no. 25 of the OERC (Terms & Conditions for determination of Generation Tariff) Regulation, 2020
- OHPC has escalated approved O&M of different power stations for FY 2021-22 @5.72% to arrive at the O&M expenses for FY 2022-23. OHPC has deducted Rs. 10.12 Cr. from O&M expenses of UIHEP, Mukhiguda for FY 2022-23 on account of dam maintenance expense receivable from DoWR.
- The escalation factor may be approved as per the provisions given in OERC (Terms & Conditions for determination of Generation Tariff) Regulation, 2020.
- Hon'ble Commission may verify the amount to be received from DoWR towards Dam Maintenance Sharing of UIHEP .

Interest on Working capital and Non-tariff income: Observations and Submission



- OHPC has claimed interest on working capital on normative basis as per provision under clause no. 24(4) of the OERC (Terms & Conditions for determination of Generation Tariff) Regulation, 2020 .
- Interest is calculated based on the SBI Marginal Cost of Funds based Lending Rate (MCLR) prevailing on 01.04.2021 plus 300 basis points; i.e. 10%.
- Working capital may be approved based on approved O&M cost and receivable according to annual fixed cost.
- **Non-tariff income:** OHPC claimed as per Clause 26 and 41 of OERC Generation Tariff Regulations, 2020. Claimed Rs 2.402 Cr as 50% of deductible non-tariff income. In FY 21-22 order, Hon'ble Commission reviewed the audited annual account and found substantial amount as other income and considered Rs 25 Cr as non-tariff income.

ARR and Tariff

Proposed ARR and Tariff (FY 2022-23) Considering Saleable D.E.of 5619.24MU



Detail Expenses	RHEP	UKHEP	BHEP	HHEP	CHEP	Sub Total	UIHEP	Total	Approved for FY 2021-22
Existing Saleable Design Energy (MU)	519.75	823.68	1171.17	677.16	485.10	3676.86	1942.38	5619.24	5619.24
Return on Equity	2.944	1.294	10.530	13.200	5.570	33.539	50.313	83.85	79.61
Interest on Loan	0.583	0.374	0.374	1.922	4.182	7.435	1.043	8.48	4.97
Depreciation	4.291	3.486	8.773	9.312	5.271	31.133	43.015	74.15	60.2
O & M expenses	63.262	65.863	61.035	68.303	31.927	290.390	96.803	387.19	365.75
Interest on Working Capital	2.382	2.443	2.450	2.771	1.340	11.386	4.674	16.06	16.15
Less: non tariff income	0.124	0.035	0.224	1.969	0.006	2.361	0.041	2.402	25.00
Total ARR (22-23)	73.337	73.426	82.938	93.539	48.284	371.524	195.807	567.328	501.680
<i>Total ARR (21-22)</i>	<i>66.58</i>	<i>66.65</i>	<i>75.99</i>	<i>85.52</i>	<i>35.91</i>	<i>330.65</i>	<i>171.04</i>	<i>501.680</i>	
Average Tariff (P/U)	141.10	89.14	70.82	138.13	99.53	101.04	100.81	100.96	89.28

Percentage Increase in Tariff of 2022-23 over Tariff of FY 2021-22



- During FY 2022-23, OHPC proposes to sale an estimated energy of 5619.24 MU at an average tariff of 100.96 paise/unit.
- During FY 2021-22 , 5619.24 MU was approved by the Commission at an average tariff of 89.28 paise/kWh
- Over all increase of **13.08%** is proposed by OHPC during FY 2022-23 tariff .

Comparison of proposed Tariff of FY 2022-23 (With Saleable D.E. of 5619.24 MU)



Power Station	Average tariff (P/U) FY 2016-17	Average tariff (P/U) FY 2017-18	Average tariff (P/U) FY 2018-19	Average tariff (P/U) FY 2019-20	Average tariff (P/U) FY 2020-21	Average tariff (P/U) FY 2021-22	Average tariff (P/U) 2022-23	Increase in P/U (% increase)
RHEP	116.08	118.20	122.82	125.78	129.34	128.10	141.10	13.00(10.15%)
UKHEP	54.87	55.74	58.32	76.47	80.49	80.91	89.14	8.23(10.17%)
BHEP	90.52	82.50	85.91	60.70	65.95	64.89	70.82	5.93(9.14%)
HHEP	140.03	144.72	151.01	126.46	129.36	126.29	138.13	11.84(9.36%)
CHEP	53.70	53.28	55.19	74.06	74.69	74.02	99.53	25.51(34.46%)
UIHEP	75.36	77.50	80.36	88.52	92.14	88.06	100.81	12.75(14.48%)

FY 22-23 proposed, all others are approved

Proposed Capacity Charge and Energy Charge (FY 2022-23)

Name of power station	Annual Fixed Cost (ARR) (Rs. in Crs)	Annual Capacity Charge (ACC) (50% of ARR) in Rs. Cr.	Annual Energy Charge (AEC) (Rs. in Crs)	Salable design energy (MU)	Energy Charge Rate (ECR) (in p/u)
RHEP	73.337	36.669	36.669	519.75	70.550
UKHEP	73.426	36.713	36.713	823.68	44.572
BHEP	82.938	41.469	41.469	1171.17	35.408
HHEP	93.539	46.770	46.770	677.16	69.067
CHEP	48.284	24.142	24.142	485.10	49.767
UIHEP	195.807	97.904	97.904	1942.38	50.404

Comparison of Two-Part Tariff

Name of power station	Approved Tariff (2021-22)		<u>Proposed Tariff (2022-23)</u>	
	Capacity Charge (Rs Cr)	Energy Charge Rate (P/U)	<u>Capacity Charge (Rs Cr)</u>	<u>Energy Charge Rate (P/U)</u>
RHEP	33.29	64.05	<u>36.669</u>	<u>70.550</u>
UKHEP	33.32	40.46	<u>36.713</u>	<u>44.572</u>
BHEP	38.00	32.44	<u>41.469</u>	<u>35.408</u>
HHEP	42.76	63.15	<u>46.770</u>	<u>69.067</u>
CHEP	17.95	37.01	<u>24.142</u>	<u>49.767</u>
UIHEP	85.52	44.03	<u>97.904</u>	<u>50.404</u>

Details of Reimbursement

Component of Costs	RHEP	UKHEP	BHEP	HHEP	CHEP	UIHEP	Total (FY 22-23)	FY 21-22 (approved)
(a) License fee for use of water for generation of electricity for FY 2022-23.	0.840	1.331	1.893	1.094	0.784	3.139	9.082	8.514
(b) ED on Auxiliary Energy Consumption for FY2022-23.	0.289	0.458	0.651	0.376	0.270	1.079	3.122	3.122 1.359
(c) SLDC charges for FY 2022-23.							1.3215	1.370
(d) Application fees and publication expenses for FY2022-23							0.270	0.265
(e) Differential publication expenses for FY2021-22							0.00434	0.050
(f) ERPC charges for FY2022-23							0.16	0.16
(g) Differential ARR of MHEP for FY2020-21							4.309	
(h) Income Tax as per Audited Account of FY 2019-20							36.1952	42.90
Reimbursement towards additional 20% share								27.42
Total							54.46404	85.16

Proposed Tariff for Machhakund HEP (FY 2022-23)

- Orissa has a share of 262.5 MU (50% of total generation) power in Machhakund Hydro Electric Project.
- As per the provisions made in the Agreement dated 23 Oct 2020, for acquiring additional 20% share of the Joint Scheme, Govt. of Odisha / OHPC made payment of Rs 27.42 Crores to GoAP/APGENCO towards present depreciated cost of the Project and shared the expenditure on account of RM & U works for all the generating units along with auxiliaries and switchyard system in the ratio of 50:50

Particulars	Amount (Rs CR)
1. Total Audited Cost of O&M Bill of MHEP (Jt.) for the FY 2020-21	51.57
2. 50% O&M Expenditure share (Orissa share of Actual O&M Expenditure for 2020-21)	25.7866
3. O&M Expenditure for FY 2022-23 applying the escalation factor	28.8210
Total Expected Expenditure during the FY 2022-23	28.8210
Tariff (Tariff of MHEP(Jt.) Scheme for FY2022-23 (paisa/ kWh)	<u>110.903</u>

- Tariff approved by Commission for FY 2021-22 – **137.29 Paise/Unit**

Conclusion

- Hon Commission may consider submissions of the consumer counsel on following parameters –
 - Capital cost and additional capitalization: based on historical cost and review of proposed additional capitalization
 - return on equity: allowed as per regulations
 - Interest on loan: as per previous orders of Commission
 - Depreciation: based on 2.57% depreciation rate and loan repayment
 - Interest on working capital: based on approved components
- Hon Commission may decide the ARR and tariff accordingly.

Thank You