



**HYDRO POWER**

in partnership with river

Ref No.:CHPLLP/2023-24/157

Date : 11.03.2024

The Secretary  
Central electricity Regulatory Commission  
3<sup>rd</sup>& 4<sup>th</sup> Floor, Chandralok Building  
36, Janpath Road, New Delhi -110001

**Sub : Comments and suggestions on draft CERC (Terms and conditions for tariff determination from Renewable Energy Sources) Regulations, 2024**

**Ref : Public Notice No. RA-14026(11)/1/2023-CERC dated 17.02.2024**

Hon'ble Sir,

At the outset, we are thankful to the Commission for providing us an opportunity to present our comments and suggestions on the captioned draft Regulations.

The Regulations shall play a vital role on determining the fate of the upcoming hydro power projects in the country. The entire hydro power sector in the country is struggling hard to cope up with numerous challenges in project construction, financing and at last fetching reasonable tariff for long term sustainable plant operations. Hence, despite of the Government push to increase the share of renewable energy projects in power generations, only few projects have seen light of the day in the past years and most of the projects are either abandoned or under NCLT proceedings.

In the COP26 summit, the Hon'ble Prime Minister committed that India would achieve 'net zero' carbon emissions by 2070. Union Budget 2023-24 presented by the Union Minister of Finance and Corporate Affairs in the Parliament this year outlined the vision of Amrit Kaal to be achieved by 2047 which shall reflect an empowered and inclusive economy. Union Finance Minister emphasized the focus of the Government on green growth efforts that help in reducing carbon intensity of the economy and provides for largescale green job opportunities.

Hydro power sector is one of the key players of Indian RE sector. It is difficult to achieve this vision unless a conducive and cohesive environment is provided to this sector.

With this background, we wish to draw your kind attention to below points for the tariff determination of Small Hydro power Projects (SHP) and request for your thoughtful consideration please.

## **CHHATTISGARH HYDRO POWER LLP**

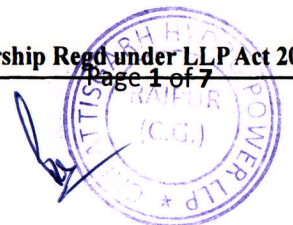
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With this background, we wish to draw your kind attention to below points for the tariff determination of Small Hydro power Projects (SHP) and request for your thoughtful consideration please.

**1. Capital cost:**

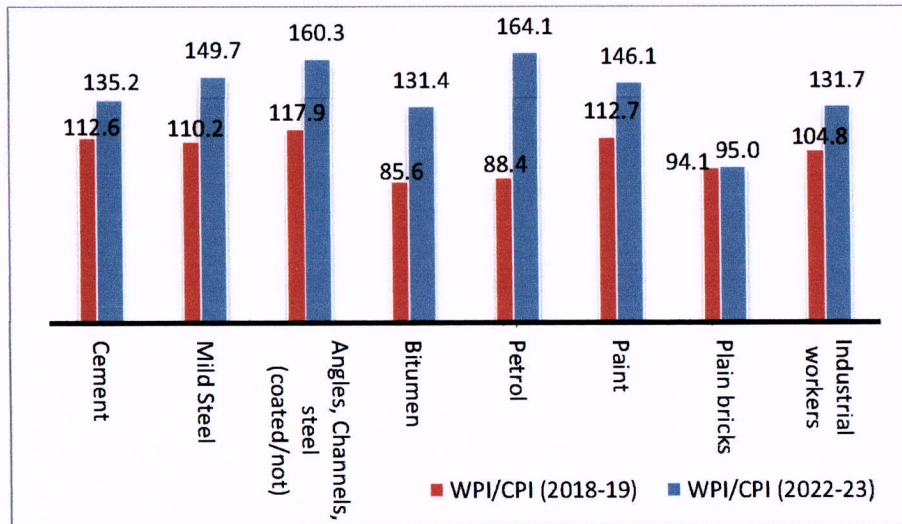
**Draft Regulation 27: Commission's Proposal:**

(1) The normative capital cost for small hydro projects during the first year of the Control Period, i.e. the financial year 2024-25, shall be as follows:

Region	Project Size	Capital Cost (Rs. lakh /MW)
Himachal Pradesh, Uttarakhand, West Bengal, Union Territory of Jammu and Kashmir, Union Territory of Ladakh and North Eastern States	Below 5 MW	1200
	5 MW to 25 MW	1200
Other States	Below 5 MW	890
	5 MW to 25 MW	1027

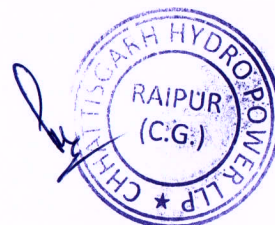
**Our Request:**

The cost of implementing small hydro projects has increased significantly due to rise in the cost of construction material like Cement, steel and labour cost. Please refer the below graphical presentation of rise in Wholesale price Index :



From the above, it may kindly be observed that the cost of basic construction material has increased substantially as tabulated below:

Material	% Increase in last 5yrs
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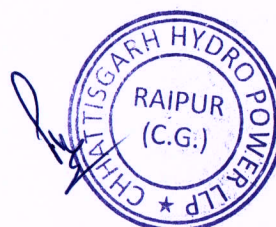
Mild Steel	36
Angles, Channels, steel (coated/not)	36
Bitumen	54
Diesel	40
Petrol	86
Paint	30
Plain bricks	1
Industrial workers	26

There is a general perception that cost of construction of projects in hilly area is much higher than that in the other states. It may kindly be appreciated that all hydro projects have same components: whether located in plains or in hilly area. Hence, cost of civil construction is almost same in all the projects. The projects in plains enjoys marginal advantage in logistic and transportation cost. But the same is off set due to following reasons:

The projects in Chhattisgarh are of low head and high discharge type. River width in Chhattisgarh is almost three times as compared to hills. Hence, larger number of gates are required in barrage to retain water for power generation. This leads to much higher hydro-mechanical cost.

- i. the low head and high discharge projects generally require heavy and bulky plant machinery like turbine and generators due to low machine RPM. We present a comparative analysis of key elements leading to higher electro-mechanical cost

Parameters	Comparison	
	Low Head, High Discharge	High Head, Low Discharge
Machine RPM	Low	High
Runner Diameter and other Turbine components	Higher size (leading to Vertical configuration)	Standard size (leading to Horizontal configuration)
Powerhouse Area	Higher due to bigger components	Lesser due to comparatively small components
Civil Infrastructure e.g. column strengthening etc.	Higher due to heavier component weights	Lesser due to lighter component weights



Parameters	Comparison	
	Low Head, High Discharge	High Head, Low Discharge
Headworks (Tunnel and Penstock)	Comparatively much bigger to handle high discharge	Lesser size
Operational and Maintenance Costs	Higher due to complexity of large rotating parts and bulky equipment	Simpler maintenance requirement and hence reduced operational cost
Price Comparison (Complete Water-to-Wire i.e. Civil, Hydro mechanical and Electromechanical works)	Approx. 13.5Cr/MW	Approx. 20% to 25% less

*Source: Analysis by Andritz Hydro Private Limited, One of the India's largest manufacturer and supplier of electro-mechanical equipment (Copy enclosed as Annexure-I)*

Moreover, such projects also require heavier civil structures like barrage, water conductor system (larger cross-sectional area of the water conductor system increases diameter of the tunnel), penstock, larger power house area etc.

Considering the technical peculiarities of the projects in this location and published data on rise in the cost of construction material, **we request the Hon'ble Commission to kindly consider normative capital cost of Rs. 13.50 Cr/MW for SHP of 5 MW to 25 MW in other States.**

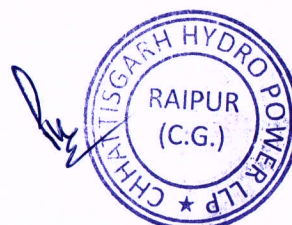
**Higher investment in construction of evacuation facilities:** Most of the projects in Chhattisgarh are in remote location which are very far away from the nearest Sub stations of the State transmission utility. As a result, long transmission line network spreading across 30-40 kms is required to be laid down for power evacuation. **Hence, we request that additional allowance for capital cost per MW for such projects where transmission line is above 10 Kms may be provided.**

## 2. Capital cost Indexation:

**Clause (2) of draft Regulation 27 provides as below:**

*The capital cost for small hydro projects as specified for the first year of the Control Period shall remain valid for the entire duration of the Control Period unless reviewed earlier by the Commission.*

We request the Commission to **please modify this clause and incorporate provision for capital cost indexation mechanism based on whole sale price index** for arriving at



the capital cost of the projects which commission during the second and third year of the control period.

### 3. Auxiliary Consumption:

#### Draft Regulation 29: Commission's Proposal:

*Normative auxiliary consumption for the small hydro projects shall be considered as 1.0%.*

#### Comments and Proposed Regulations:

The projects located in Chhattisgarh have low PLF. The plant operates mainly during rainy season. Whereas the projects with higher PLF have better water availability even in non -monsoon seasons. Hence, they have longer operating time.

Since operating time is shorter in low PLF plants, the demand for plant auxiliary consumption has to be met from external grid as well. This leads to higher auxiliary consumption.

**Hence, we request the Hon'ble Commission to allow auxiliary consumption as 1.50%.**

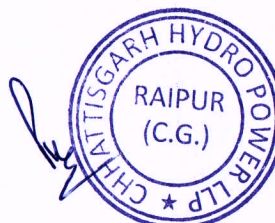
### 4. Operation and Maintenance expenses:

#### Draft regulation 30: Commission's Proposal:

*(1) Normative O&M Expenses for the first year of the Control Period, i.e. financial year 2024-25 shall be as under:*

<b>Region</b>	<b>Project Size</b>	<b>Capital Cost (Rs. lakh /MW)</b>
<i>Himachal Pradesh, Uttarakhand, West Bengal, Union Territory of Jammu and Kashmir, Union Territory of Ladakh and North Eastern States</i>	<i>Below 5 MW</i>	<i>49.54</i>
	<i>5 MW to 25 MW</i>	<i>37.15</i>
<b>Other States</b>	<i>Below 5 MW</i>	<i>39.90</i>
	<i>5 MW to 25 MW</i>	<i>28.90</i>

#### Comments and Proposed Regulations:



We request the Commission to re-consider the proposed norms for O&M expenses in case of small hydro plants due to following factors:

- i. Post covid, there is a huge increase in the manpower hiring and retention cost. To retain the skilled labour at remote project sites; they have to be provided with good remuneration.
- ii. Increasing events of natural calamities and climate change has necessitated to maintain higher inventory levels of stores and spares. Spare parts like turbine components (blades, runners), generator components, bearings, breakers, seals etc. are essential to be procured in advance to ensure seamless operational continuity and mitigating the risk of unforeseen disruption.
- iii. The cost associated with procuring these spare parts has experienced a noticeable increase in last three years. Also, wider spectrum of goods and services are now covered in GST in the past five years.
- iv. Hydro Power Projects are not eligible to claim input tax credit under GST Act and hence increase in GST has direct impact on increase in cost.
- v. Insurance cost is part of O&M expenses. The cost of project /plant and manpower insurance policies have increased manifold times after frequent incidences of huge damages due to natural calamities being reported in hydro power stations recently. Not all insurance companies readily underwrite risk for hydro stations and IRDA has substantially increased its tariff rates for hydro projects.

Considering all the above-mentioned points, we respectfully submit this formal request to the Commission **to consider normative O&M expenses for project of 5 MW to 25 MW in 'Other States' as Rs. 35 lakh/MW.**

## 5. Return on Equity

### Draft regulation 16: Return on Equity

#### Commission's Proposal:

*The normative Return on Equity for renewable energy projects other than small hydro projects shall be 14%, and that for the small hydro projects shall be 14.5%.*

Considering the difficulties faced by the developers in implementing and operating hydro power projects, unless a higher ROE is assured, this sector cannot expect better investment opportunities. Amongst all RE projects, hydro projects are the riskiest assets.



Apart from execution challenges, the risk of unforeseen natural calamities causing catastrophic damage to the plant has become very common. No investor shall undertake investment decision unless optimum return is assured. Merely, additional allowance of 0.50% for hydro projects proposed in the draft regulations is not at all justified.

**Hence, we request to increase the pre-tax ROE to minimum 16%** for small hydro power projects.

**6. Project Specific Tariff**  
**Clause 7 of the Draft Regulations**

This clause does not specifically provide that small hydro power projects are eligible for project specific tariff determination. Hence, we request for inclusion of small hydro power projects in the list of renewable energy projects covered under this provision.

**7. Suggestion for review of definition of 'Small hydro projects'**

We suggest declaring all SHP between 5 MW to 50 MW as small hydro power projects. This will discourage the tendency of underrating the Plant's installed capacity upto 25 MW to derive the preferential tariff benefits available to SHPs. This will ensure optimum recovery of plant's overheads and promote overall efficiency of the sector.

We request the Hon'ble Commission to please consider our above submissions for determination of tariff for small hydro plants.

Thanking You,

Yours Faithfully,

For, Chhattisgarh Hydro Power LLP,

  
Designated Partner

PANKAJ SARMA



Encl :As Above



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 Date: 04-March-2024

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**Subject:** Comparative Analysis for Low Head High discharge vs. High Head Low discharge Small Hydroelectric Project (<25MW) with Francis machine of same capacity and same number of units.

Dear Sir(s),

I hope this letter finds you well. As part of our commitment to transparency and comprehensive project planning, we would like to bring to your attention a detailed analysis regarding the factors influencing the **per MW cost for a same capacity hydroelectric project having same number of units**, specifically comparing Low Head (e.g. Rehar-1) and High Head options.

There could be a significant impact on the overall project cost between Low Head and High Head configurations, and hence it is crucial to have a thorough understanding of the factors involved.

**Below is a summary of key factors:**

Parameters	Comparison	
	Low Head, High Discharge (e.g. Rehar-1)	High Head, Low Discharge
<b>Machine RPM</b>	Low	High
<b>Runner Diameter and other Turbine components</b>	Higher size → leading to Vertical configuration	Standard size → Horizontal configuration
<b>Powerhouse Area</b>	Higher due to bigger components	Lesser due to comparatively small components
<b>Civil Infrastructure e.g. column strengthening etc.</b>	Higher due to heavier component weights	Lesser due to lighter component weights
<b>Headworks (Tunnel and Penstock)</b>	Comparatively much bigger to handle high discharge	Lesser size
<b>Operational and Maintenance Costs</b>	Higher due to complexity of large rotating parts and bulky equipment	Simpler maintenance requirement and hence reduced operational cost
<b>Price Comparison</b> (Complete Water-to-Wire i.e. Civil, Hydromechanical and Electromechanical works)	approx. 13.5Cr/MW	~approx. 20% to 25% less
<p><i>The above price estimate is based on historical data gathered from industry sources and past project comparisons. It's important to note that while these figures provide a general indication, actual project costs may vary depending on specific requirements, market conditions, and other factors unique to each project.</i></p>		



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In light of these considerations, it becomes evident that due to Low Head projects with high discharge requirements generally incur higher costs across various aspects, including machine specifications, civil infrastructure, and operational maintenance. The lower RPM and larger turbine components necessitate heavier civil structures, resulting in a larger powerhouse area. Additionally, the infrastructure for handling high discharge in the headworks, such as the tunnel and penstock, is comparatively much more extensive.

In conclusion, it is evident that Low Head projects with high discharge characteristics, inherently entail higher costs per MW compared to High Head projects. The intricate design and heavier infrastructure associated with Low Head configurations contribute to increased expenses throughout the project's lifecycle.

We believe that this detailed comparison will assist in making an informed decision aligned with your project goals. Please do not hesitate to reach out if you have any questions or if there are specific areas you would like to explore in more detail. We look forward to continuing our collaboration and achieving mutual success.

Yours sincerely,

For and on behalf of  
**ANDRITZ HYDRO Private Limited**

**Pankaj Sharma**  
**Deputy General Manager, Sales**

