



Registrar

# National Electric Power Regulatory Authority

## Islamic Republic of Pakistan

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No. NEPRA/R/ADG(TRF)/TRF-503/KHP-2019/6705-6707  
February 8, 2021

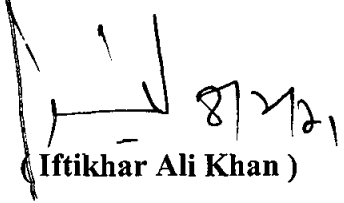
**Subject: Decision of the Authority in the matter of Tariff Petition filed by Pakhtunkhwa Energy Development Organization (PEDO) for Tariff Determination of 11.8 MW Karora Hydropower Project (Case No. NEPRA/TRF-503/KHP-2019)**

Dear Sir,

Please find enclosed herewith the subject Decision of the Authority along with Annex-I & II (22 pages) in Case No. NEPRA/TRF-503/KHP-2019.

2. The Decision is being intimated to the Federal Government for the purpose of notification in the official gazette pursuant to Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.
3. The Order along with Reference Tariff Table (Annex-I) and Debt Servicing Schedule (Local) (Annex-II) of the Authority's Decision are to be notified in the official Gazette.

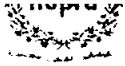
Enclosure: As above

  
(Iftikhar Ali Khan)

Secretary  
Ministry of Energy (Power Division)  
'A' Block, Pak Secretariat  
Islamabad

CC:

1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.



**DECISION OF THE AUTHORITY IN THE MATTER OF TARIFF PETITION FILED BY PAKHTUNKHWA ENERGY DEVELOPMENT ORGANIZATION (PEDO) FOR TARIFF DETERMINATION OF 11.8 MW KARORA HYDROPOWER PROJECT**

1 **BACKGROUND**

Pakhtunkhwa Energy Development Organization (hereinafter referred to as the "Company" or "the petitioner"), envisages to set up 11.80 MW run-of-the-river, high head hydro power project (hereinafter referred to as the "Project") at Khan Khwar River near Karora village, District Shangla of Khyber Pakhtunkhwa province.

PEDO filed a Tariff Petition for determination of generation tariff for the Project pursuant to the National Electric Power Regulatory Authority (Tariff Standards and Procedures) Rules, 1998.

2 **SUBMISSIONS OF THE PETITIONER**

The salient features of the petition are as follows:

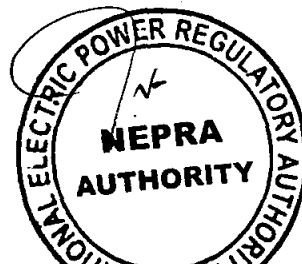
Project Size	11.8 MW
Project Site	Khan Khwar River near Karora village, District Shangla of Khyber Pakhtunkhwa Province
Construction Period	30 Months
Plant Factor	69.06%
Saleable Energy	62.962 GWh
Capital Structure	70% Debt and 30% Equity
Proposed Levelized Tariff	Rs. 15.4744/kWh (US cents 9.6715/kWh)
Total Project Cost	US\$ 48.528 Million
Rs/US\$	160

The proposed project costs are summarized below:

<b>Project Cost</b>	<b>US\$ Million</b>
EPC Cost	38.17
Land	0.38
Custom Duty	0.92
Project Management Unit Cost	0.69
Management Consultants Cost	0.85
<b>Project Cost without IDC</b>	<b>41.01</b>
Interest during Construction (IDC)	5.46
Contingency Cost	2.05
<b>Total Project Cost</b>	<b>48.52</b>

According to PEDO, the proposed project cost and reference tariff is based on the following assumptions. A change in any of these assumptions will necessitate a corresponding adjustment in the reference tariff:

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Project financing structure is based on 70:30 debt-equity ratio, although the project has been entirely funded from PEDOs resources, 70% of the project capital cost is considered to be loan and 30% is considered as equity. The proposed Reference Tariff is based on the following assumptions. Any change in any of these assumptions will result in changes in the reference tariff.

- a) The exchange rates are assumed to be 160 for PKR/USD. Exchange rates variations as per standard EPA shall be accommodated
- b) 100% of Debt has been assumed to be financed through sponsor loan provided by PEDO.
- c) O&M has been considered as 2.0% of capital cost minus IDC to keep the tariff as low as possible, although budget calculations indicate it should be approx. 2.3%
- d) A constant RoE of 16% per annum is assumed over 30 years.
- e) Custom Duties on the import of plant and equipment (7% of 70% of foreign cost) have been assumed for reference purposes.
- f) No sales tax is assumed, General Sales Tax, and all other taxes and any new taxes shall be treated as pass through items.
- g) The construction period for the purpose of Reference Tariff calculations has been assumed as 30 months from the 'Notice to Proceed' to the EPC contractor. In case the completion of the project takes more than 30 months, IDC shall be adjusted based on the actual time taken for the completion of the project if caused by Force Majeure events acknowledged by Power Purchaser/Authority.
- h) Withholding Tax on dividend @7.5 as required under the Income Tax Ordinance, 2001 is assumed. Any change in the rate of the withholding as would be pass-through to the Power Purchaser.
- i) Debt service Reserve Account (DSRA), Maintenance Reserve Account or Contingency Reserve Account or any other Reserve Account has been considered in the tariff model.
- j) During construction period, the timing of debt drawdown may vary from that estimated now; as such, the actual 'Interest during construction' (IDC) will be updated at COD and the Reference Tariff table will be adjusted accordingly. Similarly the adjustments for variations in the assumed benchmark interest rates etc. shall be applied.
- k) No hedging cost has been assumed for exchange rate fluctuations during construction
- l) Being a Public Sector project, no Water Use Charges have been considered

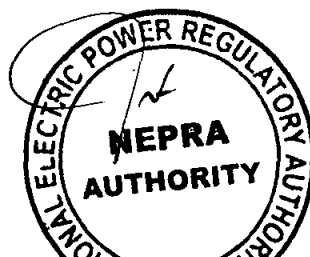
3 **Proceedings:**

The tariff petition was admitted by the Authority on December 24, 2019 and the salient features of the tariff proposal were published in daily newspapers inviting filing of replies, intervention requests or comments. It was also decided to conduct a hearing on the matter on March 11, 2020. Notices of hearing and the proposed issues to be discussed and deliberated upon during the hearing were also published in the national newspapers on February 12, 2020. In response, no intervention request was filed.

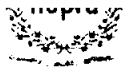
4 **Hearing:**

The hearing in the subject matter was held on March 11, 2020 at 10:30 AM, at the NEPRA Headquarters, Islamabad which was attended by the representatives of Pakhtunkhwa Energy

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Development Organization (PEDO), Central Power Purchasing Agency Guaranteed Limited (CPPA-G), Private Power Infrastructure Board (PPIB) and other stakeholders.

5 **Comments of Stakeholders:**

**Central Power Purchasing Agency (Guarantee) Limited:**

The CPPA-G participated in the hearing and also submitted detailed comments vide letter dated, March 10, 2020. CPPA-G submitted that, the tariff proposed by the Seller at EPC stage is on higher side as compared to the recently approved cases of 7.08 MW Riali –II (Rs. 8.1811/kWh) and 8 MW Kathai-II. The petitioner vide letter dated April 29, 2020 responded the higher tariff appearing in PKR is due to massive devaluation of PKR versus USD and petitioner is of the opinion that every project is different in its cost/benefit analysis and there could be variations of cost/tariff mainly because of site conditions, infrastructure and other factors. CPPA-G stated that the Seller's assumed O&M costs is exorbitant and needs to be rationalize and the WHT should not be allowed. CPPA-G also stated that the ROE of 16% is on higher side, on which the petitioner submitted that, ROE of 16% per annum has been requested, based on the cost of financing etc. in fact, for small HPPs ROE of 20% has been allowed under the Upfront Tariff. PEDO in response to the CPPA-G's objection regarding the assumption of 6 month KIBOR with a spread of 2.5% in the wake of 6% flat rate of SBP for renewable energy, stated that SBP announced its revised scheme on June 20, 2016 whereas the Project was under implementations since 2014 and its applicability is not possible. However the Authority may decide to amortize the loan over the entire period of EPA.

6 **Issues:**

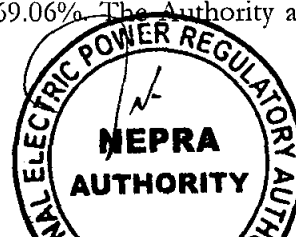
Based on the contents of the petition, certain issues were framed for hearing. Accordingly issues wise discussions and the Authority's findings and decisions are given below:

- 7 **Whether the project design/feasibility study and hydrology is updated and has been approved by the competent authority/forum? Whether the auxiliary consumption of 2% is justified? Whether the outages hours of the power plant is justified? Whether the plant Capacity and annual generation claimed by the petitioner are justified? The petitioner may be questioned whether the estimated annual energy is based on long term and reliable hydrological data.**

The petitioner submitted that, feasibility study including updated hydrology has been approved by the competent authority of PEDO. The petitioner during the hearing also submitted that, auxiliary consumption of 2% used in tariff petition is justified. Regarding the outage hours the petitioner submitted that 22 days are considered as scheduled outage while 348 hours for forced outage resulting into 90% availability per annum, which is reasonable given the scenario of "Take & Pay" mechanism to be followed in the EPA.

The Authority observed that the petitioner has not submitted approval of POE in respect of its feasibility study, however stated that the annual average energy of 71.39 GWh has been calculated based on discharges resulting in plant load factor of 69.06%. The Authority also observed that the

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petitioner has calculated the tariff on saleable energy i.e. 62.962 GWh by excluding the outages of 36.5 days (Scheduled, Forced & others) from the annual energy generation.

The Authority is of the opinion that the outages period shall not be excluded from the annual energy generation of the plant and this unprecedented mechanism for calculation of annual energy. Further the Authority also observed that 2% auxiliary consumption is also not supported. The Authority has decided to consider the net annual energy of 71.03 GWh after deduction of 0.5% Auxiliary consumption for calculation of tariff.

**8 Whether an approved Interconnection Study has been obtained?**

**Whether NOCs have been obtained from Irrigation department and Environmental Protection departments?**

The petitioner submitted that the approval has been granted by NTDC for Interconnection Study vide letter dated 21-08-2017 and by Environmental Protection Agency, Forestry Environment and Wildlife Department of Government of Khyber Pakhtunkhwa vide letter dated 15-08-2018, however NOC from Irrigation department is not required.

The Authority considered the approval and NOC obtained from the relevant departments and this issue stands addressed.

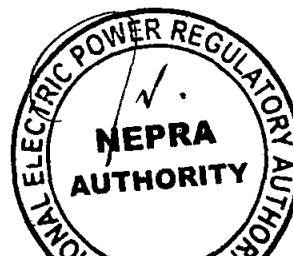
**9 Whether the construction period of 30 months claimed by the petitioner is justified?**

The petitioner has assumed a construction of 30 months in its tariff proposal and during the hearing further submitted that the original construction period was 30 months as per EPC contract. However due to some issues, extension of time (EoT) up to January 2021 has been granted to the EPC contractor, resulting in longer construction period of approximately 60 months.

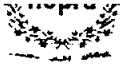
The Authority observed that the construction period of 30 months has not been approved by POEs. Also, PC-I (revised) of the project does not discuss about the construction period of the project. The Authority has compared the construction period of this project with other comparable projects and found that it is closer to the construction period of similar projects, therefore the same has been approved and all the allied adjustments at COD will be restricted to this allowed period.

The Authority has also observed that the project has not been completed within the stipulated time and no satisfactory response or justification has been submitted by the petitioner for such delay. The Authority has noted that as per the clause 27.1 of the submitted EPC contract regarding the delay in completion, it is stated that if, the contractor fails to complete the works within time for completion, and the employer shall be entitled a reduction in contract. The Authority is keen to know the reasons of delay. Therefore, the petitioner is directed to provide a detailed report at the time of COD tariff adjustment request, indicating the reasons for delay and to provide information about the mitigating decisions that have been made to recover the cost of delays from EPC contractor under the signed agreement if the delay is established as a result of non-performance of the EPC contractor and any reduction will be accounted at the time of COD stage tariff.

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- 10 **Whether the EPC cost has been arrived at through fair and transparent EPC bidding process? Whether the EPC contractor has given the details/monthly breakdown of civil work cost (adjustable and nonadjustable portion) or excavation in tunneling works?**

The petitioner submitted that the EPC contract awarded was made through competitive bidding carried in accordance with the PPRA rules.

As per the bid evaluation report submitted by PEDO, sealed bids were invited for selection of EPC contractor through International Competitive Bidding (ICB). The invitation for bids was advertised in local and national press from 25<sup>th</sup>-30<sup>th</sup> April 2014. In order to ensure healthy competition, the closing date for submission of bids was extended from 20<sup>th</sup> May to 20<sup>th</sup> June 2014. The bids were received and opened on July 10, 2014. Out of the Eighteen (18) firms who purchased the bid documents, the following four (04) Bidders submitted their bids.

- i. GRC, JV
  - Ghulam Rasool & Co. Multan,
  - Tinjin Design & Research Institute of Electric Co.(TRIED)-China
  - Hydro-China Corporation-China
- ii. UEC-CHCEG-CWTW, JV
  - United Engineers-Pakistan
  - CWTW-China
  - CHCEG-China
- iii. Habib Rafiq Pvt. Ltd Lahore
- iv. Descon-Karora, JV Lahore

As per the bid evaluation report, the bids were opened at 1330 hours on 10<sup>th</sup> July in the committee room of PEDO by the bid opening committee, the composition of which was as follows:

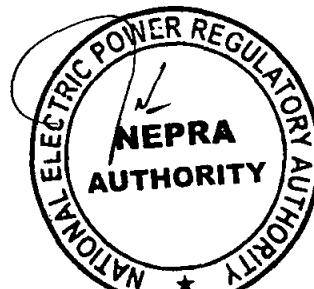
- |                              |  |
|------------------------------|--|
| i. Mr. Farhat Mehmood        | Project Director, Feasibility Study (Convener) |
| ii. Mr. Muhammad Bashir Khan | Director, Finance and Administration (Member)  |
| iii. Mr. Muhammad Shafi      | Project Director, Karora HPP (Member)          |
| iv. Riaz-ul-Haq              | Project Manager, Karora HPP (Member)           |

Evaluation Committee of PEDO, technically evaluated the bids and all bidders except UEC-CHCEG-CWTW JV being conditional were post qualified. Thereafter sealed price proposals of 03 bidders were opened on 08<sup>th</sup> August, 2014 at 1130 hours in the committee room of PEDO office by the bid opening and evaluation committee. The following read out prices were announced.

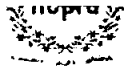
- |                       |                        |
|-----------------------|------------------------|
| i. GRC JV             | Rs. 3,781,370,353 only |
| ii. HRL               | Rs. 5,114,572,400 only |
| iii. DESCON-Karora JV | Rs. 5,523,171,011 only |

As per the bid evaluation report, all bidders confirmed to the bid documents, therefore no bidder was declared non-responsive and after arithmetic check the bid prices are as follows:

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|------|------------------|------------------------|
| i.   | GRC JV           | Rs. 3,785,938,575 only |
| ii.  | HRL              | Rs. 5,117,824,145 only |
| iii. | DESCON-Karora JV | Rs. 5,524,039,391 only |

As per the bid evaluation report submitted by PEDO, on the basis of financial and systematic evaluation of bids the bid opening committee of PEDO concluded that the, the bid of M/S GRC-JV is the lowest evaluated and responsive bid. Therefore, the bid opening and Evaluation Committee of PEDO recommended that the contract for design, procurement and construction of Karora Hydropower Project may be awarded to GRC-JV.

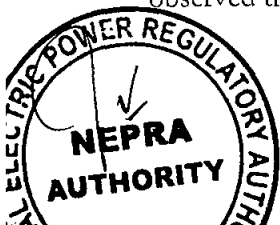
The bid evaluation report states that, based on the recommendations of the evaluation committee, the bid quoted by GRC-JV being the lowest bid and within the limit of the revised cost estimate, is hereby approved for award of contract. PEDO then accordingly signed the EPC contract on **November 14, 2014** with M/S GRC- JV.

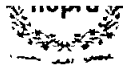
The Authority has observed that the price bid evaluation report dated August 2014 is detailed and illustrates the procedure adopted for selection of EPC contractor through competitive bidding process. The Authority noted that submitted bid evaluation report suggests that bid prices were checked, evaluated and adjusted for arithmetic errors, exchange rate variations, time for completion, and various price adjustment for completeness of scope, technical compliance, commercial compliance and deviations in terms of payment and completion schedules. The lowest evaluated bid price of GRC-JVs was considered reasonable as it was the lowest.

However, the Authority has observed that EPC cost of Karora HPP arrived through competitive bidding process is on higher side as compared to the benchmark costs approved by the Authority for high head small hydropower projects. The Authority noted that in the instant case, for the conversion of local portion of the EPC cost of Rs 1.917 billion (comprising about 39% of total project cost) an exchange rate of PKR.98.7012 has been used. The Authority is of the considered view that an updated exchange rate should be used and accordingly an exchange rate of PKR 160 has been used, thus the resultant EPC cost out as USD 30.917 million instead of claimed US\$ 38.17 million.

Further, the Authority noted that the claimed EPC cost is inclusive of provisional cost of US\$ 5.29 million and transmission line cost of US\$ 2.12 million. The Authority understands that since the project is at advance stage and it is not justified to unnecessary burden the EPC price by including the provisional cost in local portion of the EPC price and accordingly this has been excluded from the local portion of the EPC price. Further the Authority is also of the view the inclusion of transmission line cost in the foreign portion of EPC cost is not justifiable and the same has also been excluded from the EPC price, however the issue of transmission cost has been separately discussed in the succeeding paragraphs under the relevant issue. After taking into account the aforementioned resultant EPC cost of US\$ 25.53 million falls within the acceptable range and has therefore been considered by the Authority and the same is allowed.

In addition to the above, the Authority also noted that, the petitioner has not specifically mentioned the price adjustment formula anywhere in the tariff petition however, upon scrutiny, it has been observed that the formula for adjustment in EPC price is not entirely in line with the price adjustment





formula approved for NEPRA's 3 stage mechanism for determination of tariff for hydropower projects. The Price Adjustment formula given in the EPC contract of the project stipulates that 35% of the contract price will be fixed whereas, an adjustment for variation in published statistics for labour and material cost will be applied on an abnormally large portion of the EPC price i.e. on the remaining 65% of the entire EPC price.

In comparison, the price adjustment formula approved for upfront tariff for small hydropower projects as well as other hydropower project stipulates that the following price adjustment factor will be applied to only the local portion of Civil Works as shown hereunder:

$$P_n = 0.51 + 0.10 * (C_n/C_o) + 0.09 * (S_n/S_o) + 0.15 * (F_n/F_o) + 0.15(L_n/L_o)$$

Where;

$P_n$  is the adjustment factor to be applied for civil works;

$C_n$  is the index value for the relevant month for Cement as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

$S_n$  is the index value for the relevant month for Steel Bar & Sheets as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

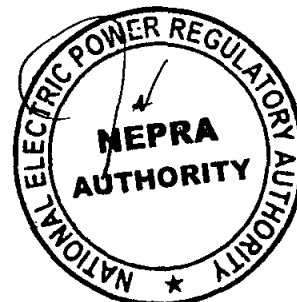
$F_n$  is the index value for the relevant month for Diesel Oil as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

$L_n$  is the index value for the relevant month for Mason (Raj) as per the Wage Rates published in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

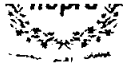
$C_o$ ,  $S_o$ ,  $F_o$  and  $L_o$  are the reference values of the price indices for Cement, Steel Bar & Sheets, Diesel Oil and Mason (Raj) respectively as available one month prior to EPC bid submission deadline which in the instant case shall be June 2014.

The Authority is of the opinion that the price adjustment formula of the upfront tariff is more well-defined and already incorporated in several tariff determination of hydro project, therefore, the consistent formula is hereby allowed to the petitioner for one-time adjustment in EPC price instead of the formula mentioned in the EPC contract.

The allowed EPC contract price works out to US\$ 25.53 million. Recapitulating the aforementioned the following is the summary of the EPC cost. The reference exchange rate of 1 US\$ = PKR 160 as stated in tariff petition has been used. The foreign portion of EPC cost will be subject to US\$/PKR variation whereas the local amount will not be subject to any exchange rate variation.







S No.	Title	EPC Price Million
1.	Foreign Component US\$	18.94
	Less: Transmission Cost US\$	(2.12)
	<b>Total Foreign Component US\$</b>	<b>16.82</b>
2.	Local Component PKR	1,916.74
	Less: provisional sum for price adjustments	(522.66)
	Total Local Component PKR	1,394.08
	<b>Total Local Component in US\$ @ 160</b>	<b>8.713</b>
3.	<b>Equiv. US\$ Total EPC Price</b>	<b>25.53</b>

**11 Whether a sum of US\$ 2.12 million for transmission line is justified for inclusion in generation tariff?**

The petitioner has submitted that the foreign portion of EPC price includes an amount US\$ 2.12 million for laying 132 KV transmission line of 12 km and the same may also be allowed. The petitioner in its reply to CPPA-G vide letter dated April 29, 2020 also submitted that, the Authority in the determination of Ranolia HPP, made the judgment that cost of transmission line if paid by PEDO to PESCO or NTDC shall be reimbursed and the same mechanism may be followed in this case too.

The Authority understands that addressing the issue of interconnection especially for hydro projects is of critical importance. Unlike in thermal plants —where the choice of location of the plant depends on the load center and its proximity to the nearest interconnection point— hydro plant location is fixed and everything else revolve around it. The Authority in case of a recently approved small hydropower i.e. Riali-Hydropower of comparable size project approved the following:

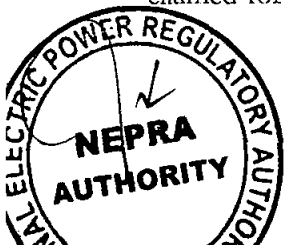
*“The Project Sponsors proposed that the Company will submit cost details & nominal tariff to NEPRA for approval pertaining to financing & construction of Purchaser's Interconnection facilities at the time of COD of the Project. In case of PESCO/Power Purchaser refusal to carryout O&M services for Purchaser's Interconnection facilities, then the Sponsors at the time of Project COD or earlier will request the Authority for the issuance of tariff or Special Purpose Transmission License (if required) in order to carry out the aforesaid O&M services. Further, net delivered energy shall be adjusted for line losses subject to figure as allowed under the NEPRA (Interconnection for Renewable Generation Facilities) Regulations, 2015 (amended on June 07, 2018).”*

For this project, the Authority also approves the same mechanism and therefore, cost of USD 2.12 million on account of cost of T/L has not been not made part of the project at this stage.

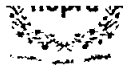
**12 Whether the Land purchase and infrastructure development cost of US\$ 0.384 million claimed by the petitioner is justified?**

The petitioner in its tariff petition stated that an area of 267 Kanals has been acquired for an amount of Rs.61.50 million or USD 0.384 million.

The Authority observed that since 80% of the project has been completed, therefore, the cost claimed for land purchase and infrastructure development must have been incurred. Accordingly the



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petitioner was asked to provide the cost details duly supported by bank statements and invoices, however no documentary evidence has been submitted for verification of the expenditure at this stage; therefore, the claimed cost has not been ascertained. However, the Authority understands that this cost cannot be negated as land and its allied costs are undeniable part of hydropower project, therefore, the Authority has decided to allow the requested cost as maximum ceiling at this stage subject to adjustment at actual on COD based on verifiable documentary evidence. Accordingly the cost of PKR. 61.440 million equivalent to US\$ 0.384 million has been assumed. Further at COD no adjustment for exchange rate will be allowed.

**13 Whether the Custom Duties of US\$ 0.915 million calculated @ 7% of the 70% of foreign cost for the import of plant and equipment is justified?**

The petitioner submitted that, Customs duties are calculated based on 70% of foreign portion of EPC (not being applicable on design and services). This number is adjustable subject to provision of documentary evidence. The Authority may decide as per its own assessment subject to adjustment as per actual on production of documentary evidence.

The Authority has observed that as the EPC contract stipulates that the rates and prices quoted by the contractor in the schedule of prices shall be deemed to have included (i) business taxes, income tax, super tax, customs, import duties and other taxes on income, and (ii) fees charged for services provided under the Contract. Therefore, the petitioner's claim and its adjustment for duties and taxes at COD will not be required and accordingly the same is not allowed.

**14 Whether the Non-EPC cost of US\$ 1.545 million pertaining to project management unit cost and management consultancy cost claimed by the petitioner is justified?**

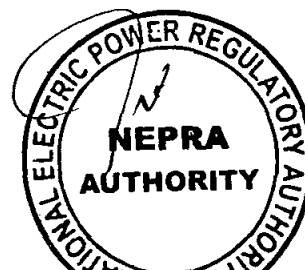
The petitioner claimed US\$ 1.545 million as a Non-EPC with the following break:

S.No	Cost Head	Amount US\$ Million	Amount PKR Million
1.	Management Consultancy Cost	0.853	136.48
2.	Project Management Unit Cost	0.692	110.72
<b>Total</b>		<b>1.545</b>	<b>247.2</b>

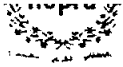
**Management Consultancy Cost:**

The petitioner stated that this covers the cost of update feasibility, bid level design, tender document, bid evaluation, contract negotiation as well as complete construction management and services during defect liability period.

The Authority noted that as per management consultant (MC) contract document the completion period of the contract services is 50 months and 12 months for defect liability period (DLP). When the initial contract was expired in January 2018, an amendment to the contract has been made and the contract has been extended for 68 months and 12 months for DLP.



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The Authority further noted that the contract price of initial contract is PKR 106.16 million instead of claimed cost of PKR.122.08 million. The Authority also observed that this contract price also includes PKR 14 million provisional sum and PKR 6.03 million for remuneration of the foreigners. As per the initial contract, both the aforementioned heads shall be adjusted as per actual on the completion of the contract.

The Authority understands that the project has been delayed approx. for two years and reason for that delay has yet to be provided and the cost of delay, provisional sum and non-incurred cost on account of salaries/other remunerations should not be built in the tariff and only those cost should be reflected which are legitimate. Therefore, the amount of PKR 6.03 million along with the provisional sum shall be excluded from this head.

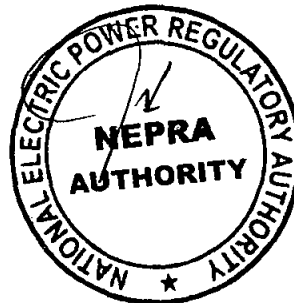
Moreover, the Authority further observed that an amount of Rs. 14.4 million (US\$ 0.09 million) for hiring an independent engineer has also been included under this head which the Authority has not allowed in other comparable projects under this head as the same should be covered under the project management unit cost after taking into account the discussed adjustments an amount of PKR 86.12 million is allowed as a maximum cap subject to adjustment as per actual in PKR only. In case of cost being less than approved ceiling the same shall be adjusted at COD.

**Project Management Unit Cost:**

The petitioner stated that, this cost covers the project establishment for the preconstruction as well as employer's cost during construction. The amount considered under this head is USD 0.692 million.

The Authority noted that the petitioner's claimed cost are mainly estimates and are devoid of any supporting documents, and therefore, previously established cost benchmarks need to be relied upon. The estimated PMU costs claimed by the petitioner are primarily project development cost and is on higher side as compared to previously established benchmarks for small hydropower projects executed in similar manner, i.e. EPC/Turnkey Contracts with outsourced engineering and administration of the Project to Management Consultants.

The Authority has allowed a maximum development cost of US\$ 0.22 Million for 36 MW Daral Khawar Hydropower Project of PEDO vide decision dated January 09, 2018 on the basis of cost allowed to provincial government projects in Punjab and KPK executed under the Renewable Energy Development Sector Investment Program (REDSIP), which aims to develop indigenous, nonpolluting, and renewable sources of energy to help meet Pakistan's power shortage and diversify the power sources. In view thereof, a development cost of US\$ 0.22 million (PKR.35 million) is hereby allowed by the Authority for this project too with a proviso that the individual items may vary but the overall allowed should be the maximum cap and will not be subject to any exchange rate variation. In case of cost being less than approved ceiling the same shall be adjusted at COD.



Recapitulating the above, following is the summary of Non-EPC cost.

S.No	Cost Head	Claimed Amount PKR Million	Allowed Amount PKR Million
1.	Management Consultancy Cost	136.48	86.12
2.	Project Management Unit Cost	110.72	35.00
<b>Total</b>		<b>247.20</b>	<b>121.12</b>

15 **Whether the claimed Contingency cost of US\$ 2.050 million is justified?**

The petitioner has claimed a contingency cost of US\$ 2.050 million or 5% of the Capex and further stated that this needs to cover unforeseen expenses mainly resulting from delays etc.

The Authority has allowed cost of contingency for civil works and E&M equipment claimed by other hydropower projects that are at an the initial stage, however, in the instant case, the Project is at the advance stage and therefore the risk of uncertainty is minimal. Therefore, allowing this cost is not justified, accordingly the Authority has not considered this cost and the same is not allowed.

16 **Whether the terms and conditions of debts claimed by the petitioner are justified?**

The petitioner submitted that the project financing structure is based on 70:30 debt to equity ratio and the entire finances will be funded from PEDO's own resources i.e. 20% from annual development program (ADP) and 80% from Hydel Development Fund (HDF) and also stated that 70% to be considered as loan and 30% is an equity. The petitioner further submitted that KIBOR of 8% plus spread of 2.5% with a loan tenure of 10 years has been assumed.

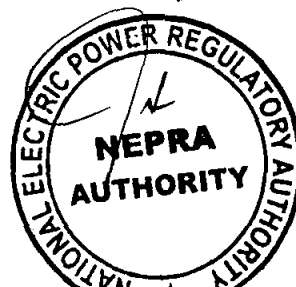
CPPA-G stated that the seller's assumed debt servicing, 06 months average of KIBOR, with spread of 2.5% is on higher side. As per the NEPRA's Benchmarks, the debt financing under the Revised SBP financing scheme for renewable energy, provides a flat rate of 6% for debts with a debt repayment period not exceeding 12 years. Riali-II and Kathai-II have availed debt financing under the SBP scheme @ 5.5% flat interest rate.

The petitioner while responding to the comments of CPPA-G stated that the application of flat 6% interest rates as per SBP debt financing is misplaced. SBP announced its revised scheme on June 20, 2016 whereas the Project was under implementations since 2014 and its applicability is not possible. However the Authority may decide to amortize the loan over the entire period of EPA.

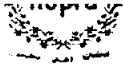
The Authority noted that Hydel Developmental Fund (HDF) has been utilized for this Project. The HDF is established through "The [Khyber Pakhtunkhwa] Hydel Development Fund Ordinance, 2001". The relevant extract of the Provincial ordinance is hereunder:

*Establishment of the Fund.—(1) As soon as may be after the commencement of this Ordinance, Government shall establish a Fund to be known as the Hydel Development Fund.*

[11]



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(2) Subject to the availability of resources, with particular reference to its overall liabilities, Government shall, on yearly basis, contribute to the Fund, such amount as it may determine, out of the total amount received from the Federal Government or an authority of the Federal Government on account of net profits earned by it from the generation of hydro electricity, for the purposes of this Ordinance, and may, in cases of exigencies, contribute to the Fund from other grants received from the Federal Government or any other agency or from its own budget pertaining to the Annual Development Programme.

(3) All profits from hydel projects undertaken from the Fund shall be deposited in the Provincial Consolidated Fund at the close of each financial year:

Provided that Government shall contribute ten per cent of such profits to the Hydel Development Fund.

(4) The amount contributed to the Fund shall be exclusively utilized for the development of hydel electricity in the Province and shall be operated upon in accordance with the provisions of this Ordinance and the rules made thereunder.

The Authority opined that HDF is basically funded by NHP which the province of KPK receives time to time from WAPDA Hydroelectric operated power plants established in the province, therefore, allowing cost of debt in the lines of commercial banking is not justified. The Authority noted that the project is under implementation since 2014, whereas the State Bank of Pakistan (SBP) announced the financing for Renewable Energy in 2016. Further it was also observed that PEDO with its own funding (coming largely from HDF) is not expected to approach SBP for lending needs nor SBP has the required sources set aside which will cover all existing and future lending needs of PEDO sponsored project including other private sector RE projects. In view of the above the application of 6% concessional lending rates of SBP may not be applicable. The issue of cost of HDF funding need to be seen from an opportunity cost point of view. It was observed that an unutilized HDF is generally invested in risk-free asset (short to long term securities). For this purpose, KIBOR is an appropriate benchmark. Therefore, the Project is being allowed cost of debt at 6 months KIBOR of 7.30 % without any spread which shall be adjusted biannually with any variation in KIBOR. Further the Authority also appreciates the petitioner suggestions of spreading the loan over the entire 30 years of the project tariff and thus approves the same. However debt: equity ratio shall be on the basis of 80;20 capital structure.

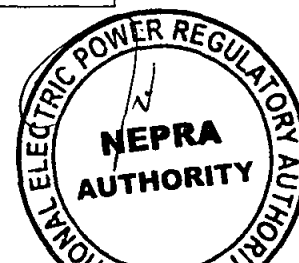
Recapitulating the above the approved total project cost is mentioned as hereunder:

Cost Head	Approved Cost US\$ Million
EPC Contract/Construction	25.53
Land Cost	0.384
Management Consultants Cost	0.54
Project Management Unit Cost	0.22
<b>Project Cost with IDC</b>	<b>26.67</b>
Interest During Construction (IDC)	2.33
<b>Total Project Cost</b>	<b>29.00</b>

17 **Whether the operating costs claimed by the petitioner are justified?**

The petitioner in tariff petition claimed an O&M component with the following component wise breakup:

<b>Variable O&amp;M Cost</b>	Rs/kWh	0.279
<b>Fixed O&amp;M Cost</b>	Rs/kWh	1.860
<b>Total</b>	Rs/kWh	2.139



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MPD&R also submitted that annual O&M is on higher side and should be 1% of base cost.

The Authority observed that the proposed cost for operation & maintenance of the plant is on higher side than the O&M cost allowed by NEPRA to other comparable hydropower projects. The Authority also relied upon international reports prepared for U.S's Department of Energy wherein, the O&M cost works out as \$ 0.472 million or 0.04 million USD/MW and the same has been approved with bifurcation into 15% as Variable O&M (100% local) and 85% Fixed O&M (foreign and local portion in the ratio of 60% & 40% respectively) as allowed to other hydro projects.

Moreover, the Authority has also decided that the petitioner should conduct a transparent and competitive bidding process for the selection of O&M contractor for this project with the approved cost as a ceiling. The following O&M cost has been allowed to the petitioner.

<b>Fixed O&amp;M Cost Claimed vs. Assessed</b>					
		Claimed		Assessed	
		US\$ Mln	Rs. /kWh	US\$ Mln	Rs./kWh
Variable O&M	Local	0.1098	0.2791	0.0708	0.1595
Fixed O&M	Local	0.7321	1.860	0.1605	0.3615
	Foreign			0.2407	0.5422
<b>Total O&amp;M Cost –Local</b>		<b>0.8419</b>	<b>2.1395</b>	<b>0.4720</b>	<b>1.0632</b>

**Insurance during Operation:**

The petitioner has claimed annual operating insurance @ 1% of EPC contract which is in line with the NEPRA (Benchmarks for Tariff Determination), Guidelines, 2018.

It was noted that there is a decline in the global insurance cost the impact of which is also seen in recent hydro power projects where the annual insurance premium paid was as low as 0.46% of the EPC cost. In view thereof the Authority has decided to allow insurance during operation @0.75% of EPC cost subject to adjustment on the basis of actual up to maximum at 1% of the EPC cost upon provision of verifiable documentary evidence by the petitioner at the time of COD.

**18 Whether Withholding Tax on dividend should be allowed as a pass through item?**

The petitioner requested that any withholding tax on dividends will be considered as a pass-through.

The Authority's approved tariff guidelines clearly stipulate that the withholding tax on dividends shall not be allowed as a pass-through item in any technology. Therefore, the request of the petitioner to allow WHT as a pass through item being inconsistent with the guidelines is hereby declined.

**19 Whether the Return on Equity (ROE) and Return on Equity during Construction (ROEDC) computed at 16% is justified?**

The petitioner has computed ROE and ROEDC @ 16% and further submitted that the request is reasonable as NEPRA has been allowing IRR of up to 17-18% to HPPs.



The Authority noted that Cabinet Committee on Energy (CCoE) in its meeting held on August 27, 2020 reduced the return of public sector power projects for which petitions have been submitted before the Authority for revision in tariffs. The details of which are summarized below:

- RLNG 12% return with US indexation
- Nuclear 14.5% @148 exchange rate with no further US indexation
- WAPDA/GENCO, 10% return with no US indexation

The Authority is of the view that the instant project being owned by KPK government should also be treated in the same manner in terms of return and any discrimination in the level of return between federal government power plants and provincial government power plants may defeat the spirit of the decisions taken in CCoE for reduction in overall national capacity charges. In view of the above, the Authority has decided to allow a return of 10% for the Project as recently reduced by CCoE for WAPDA hydroelectric with no USD indexation. The annual return component computation has been adjusted to address the time value issue of annual vs monthly return payment.

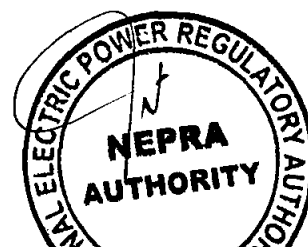
In addition to above, the Authority has also decided that the return allowed for this Project should be considered as the maximum ceiling and the return beyond the stated limited, if any, should be adjusted for which a claw back mechanism shall be prescribed at the time of COD.

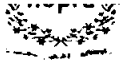
20 The petitioner has stated that the tariff is based on Take & Pay, with must run provision, accordingly single part tariff has been allowed to the Project.

## 21 ORDER

In pursuance of section 7(3)(a) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with NEPRA (Tariff Standards & Procedure) Rules, 1998, the Authority hereby determines and approves the following generation tariff along with the terms and conditions for Karora Hydropower Project of Pakhtunkhwa Energy Development Organization (the petitioner) for delivery of electricity to Power Purchaser:

- i) Levelized tariff works out to be Rs. 7.2850 per kWh (US Cents 4.5531 per kWh)
- ii) EPC cost of US\$ 25.53 million has been approved.
- iii) Non-EPC cost of Rs. 121.12 million including Managing Consultancy Cost of Rs. 86.12 million and Project Management Unit Cost of Rs. 35 million has been approved.
- iv) Land and Resettlement cost of Rs. 61.440 Million (US\$ 0.384 Million) has been assumed for calculation.
- v) Debt to Equity ratio of 80:20 has been approved.
- vi) Debt repayment period of 30 years has been taken into account for 100% local loan.
- vii) The KIBOR rate of 7.30% as of September 30, 2020 has taken into account while calculating the cost of debt.





- viii) Annual ROE & ROEDC of 10% has been approved.
- ix) The reference tariff has been calculated on the basis of net annual benchmark energy generation of 71.0290 GWh for installed capacity of 11.80 MW. An auxiliary consumption has been restricted to 0.5%.
- x) The above charges will be limited to the extent of net annual energy generation of 71.0290 GWh. Net annual generation supplied during a year to the Power Purchaser in excess of benchmark energy of 71.0290 will be charged at 10% of the prevalent approved tariff.
- xi) O&M cost of US\$ 472,000 per annum has been approved.
- xii) Insurance during the operation has been calculated as 0.75% of the EPC cost.
- xiii) The reference US\$/PKR rate has been taken as 160.
- xiv) Construction period of 30 months has been approved and the same is used for the workings of ROEDC and IDC.
- xv) IDC and ROEDC have been worked out using the following drawdown schedule:

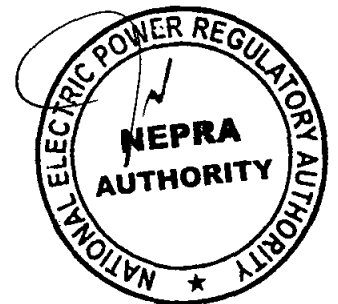
Period (Months)	Draw Down (%)
06	20
12	15
18	20
24	20
30	25

- xvi) In the above tariff no adjustment for carbon emission reduction receipts, has been accounted for. However, upon actual realization of carbon emission reduction receipts, the same shall be distributed between the Power Purchaser and the petitioner in accordance with the approved mechanism given in the applicable government policy.
- xvii) The above tariff is applicable for a period of thirty years commencing from the commercial operations date (COD).
- xviii) The tariff is based on Take & Pay, with must run provision, accordingly single part tariff has been allowed to the Project
- xix) The component wise tariff is indicated at Annex-I.
- xx) Debt Servicing Schedule is attached as Annex-II.

**I. One Time Adjustments**

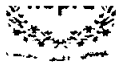
The following onetime adjustments shall be applicable to the reference tariff:

- a. The EPC cost shall be verified and adjusted at actual considering the approved amount as the maximum limit. Applicable foreign portion of the EPC cost will be adjusted at COD on



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account of variation in PKR/USD parity during the construction period, on production of authentic documentary evidence by the petitioner to the satisfaction of the Authority. The adjustment in applicable portion of the approved EPC cost shall be made only for the currency fluctuation against the reference parity values. The local portion of EPC contract will not be subject to any exchange rate variation and the allowed PKR amount shall be actualized. The Lower of Actual or approved shall be taken into account at COD.

- b. The local portion of Civil Works Cost only will be adjusted on account of variation in the price of construction material (Cement, Steel, Labour and Fuel) during the project construction period as per the following mechanism/formula:

$$P_n = 0.51 + 0.10 * (C_n/C_o) + 0.09 * (S_n/S_o) + 0.15 * (F_n/F_o) + 0.15(L_n/L_o)$$

Where;

$P_n$  is the adjustment factor to be applied for civil works;

$C_n$  is the index value for the relevant month for Cement as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

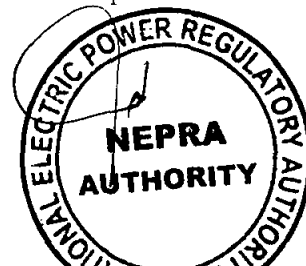
$S_n$  is the index value for the relevant month for Steel Bar & Sheets as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

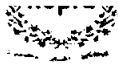
$F_n$  is the index value for the relevant month for Diesel Oil as given in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

$L_n$  is the index value for the relevant month for Mason (Raj) as per the Wage Rates published in the Monthly Bulletin of Statistics published by the Pakistan Bureau of Statistics;

$C_o$ ,  $S_o$ ,  $F_o$  and  $L_o$  are the reference values of the price indices for Cement, Steel Bar & Sheets, Diesel Oil and Mason (Raj) respectively as available on June 2014 which is one month prior to the EPC bid submission deadline.

- c. Any liquidated damages, penalties, etc. (by whatever name called), actually recoverable by the petitioner from the EPC contractor(s), pertaining to the construction period allowed by the Authority, will be adjusted in the project cost at COD.
- d. Land and Resettlement costs will be allowed as per actual, at the time of COD upto to maximum of Rs. 61.440 Million (US\$ 0.384 Million) allowed now, upon production of verifiable documentary evidence. The initial schedule of rates and variation in them shall be certified by the Provincial government and approved by NEPRA.
- e. Non-EPC cost of Rs. 121.12 million including Managing Consultancy Cost of Rs. 86.12 million and Project Management Unit Cost of Rs. 35 million shall be subject to verification at COD in PKR only. The lower of actual or approved shall be taken into consideration.
- f. If no insurance cost has been incurred during operation phase of the power plant, the assumed calculated tariff component shall be excluded from the tariff components at COD stage.





- g. Interest During Construction (IDC) will be adjusted at COD on the basis of actual debt composition, debt drawdown of loan (not exceeding the amount allowed by the Authority) and applicable interest rate during the actual project construction period (not exceeding the construction period allowed by the Authority).
- h. The return on equity (including return on equity during construction) will be adjusted at COD on the basis of actual equity injections (within the overall equity allowed by the Authority at COD), during the project construction period allowed by the Authority.
- i. The reference tariff table shall be revised at COD while taking into account the above adjustments. The petitioner shall submit its request to the Authority within 90 days of COD for necessary adjustments in tariff at COD.

**II. Indexations:**

The following indexation shall be applicable to the reference tariff:

i) Indexation applicable to O&M

The local part of O&M cost will be adjusted on account of local inflation and O&M foreign component will be adjusted on account of variation in dollar/rupee exchange rate and US CPI. Quarterly adjustments for inflation and exchange rate variation will be made on 1<sup>st</sup> July, 1<sup>st</sup> October, 1<sup>st</sup> January and 1<sup>st</sup> April respectively on the basis of latest available information with respect to CPI - General (notified by the Pakistan Bureau of Statistics), US CPI (notified by US Bureau of Labor Statistics) and revised TT & OD selling rate of US Dollar as notified by the National Bank of Pakistan. The mode of indexations will be as follows:

$$F O\&M_{(L,REV)} = F O\&M_{(L,REF)} * CPI_{(REV)} / CPI_{(REF)}$$

$$F O\&M_{(F,REV)} = F O\&M_{(F,REF)} * US CPI_{(REV)} / US CPI_{(REF)} * ER_{(REV)} / ER_{(REF)}$$

$$V O\&M_{(L,REV)} = V O\&M_{(L,REF)} * CPI_{(REV)} / CPI_{(REF)}$$

Where;

$F O\&M_{(L,REV)}$  = The revised applicable fixed O&M local component of tariff

$F O\&M_{(F,REV)}$  = The revised applicable fixed O&M foreign component of tariff

$V O\&M_{(L,REV)}$  = The revised applicable variable O&M local component of tariff

$FO\&M_{(L,REF)}$  = The reference fixed O&M local component of tariff for the relevant period

$FO\&M_{(F,REF)}$  = The reference fixed O&M foreign component of tariff



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for the relevant period

$VO\&M_{(I,REF)}$	=	The reference variable O&M local component of tariff for the relevant period
$CPI_{(REV)}$	=	The revised Consumer Price Index (General) as notified by the Pakistan Bureau of Statistics
$CPI_{(REF)}$	=	138.32 Consumer Price Index (N-CPI) of September 2020 notified by the Pakistan Bureau of Statistics
$US\ CPI_{(REV)}$	=	The revised US CPI (all urban consumers)
$US\ CPI_{(REF)}$	=	260.280 US CPI (all urban consumers) for the month of September 2020 as notified by the US Bureau of Labor Statistics
$ER_{(REV)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan
$ER_{(REF)}$	=	The reference TT & OD selling rate of US dollar as notified by the National Bank of Pakistan - Current reference 160.

ii) Adjustment of insurance component

The insurance component of the reference tariff will be adjusted as per actually incurred prudent costs, subject to the maximum ceiling of 1% of the approved EPC cost, on annual basis upon production of authentic documentary evidence by the petitioner.

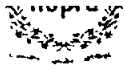
iii) Adjustment for KIBOR variation

The interest part of debt service component will remain unchanged throughout the term except for the adjustment due to variation in 6 months KIBOR, according to the following formula:

$$\Delta I = P_{(REV)} * (KIBOR_{(REV)} - 7.30\%) / 2$$

Where:

$\Delta I$  = the variation in interest charges applicable corresponding to variation in 6 months KIBOR.  $\Delta I$  can be positive or negative depending upon whether 6 months KIBOR<sub>(REV)</sub> per annum > or < 7.30%. The interest payment obligation will be enhanced or reduced to the extent of  $\Delta I$  for each half year under adjustment.



$P_{(REV)}$  = is the outstanding principal (as indicated in the attached debt service schedule to this order at Annex-II) on a bi-annual basis at the relevant calculations date.

**V. Terms and Conditions of Tariff:**

**Design & Manufacturing Standards:**

Hydro power generation system shall be designed, manufactured and tested in accordance with the latest IEC standards or other equivalent standards. All plant and equipment shall be new.

**Emissions Trading/ Carbon Credits:**

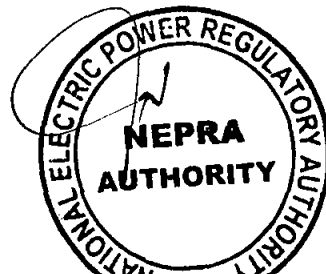
The petitioner shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the Power Purchaser as per the applicable government policy and the terms and conditions agreed between the petitioner and the Power Purchaser.

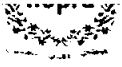
**Power Curve of the Hydel Power Complex:**

The power curve of the Hydel Power plant shall be verified by the Power Purchaser, as part of the Commissioning tests according to the latest IEC standards and shall be used to measure the performance of the hydel generating units.

**Others:**

- i. The Authority has allowed/approved only those cost(s), terms term(s), condition(s), provision(s), etc. which have been specifically approved in this tariff determination. Any cost(s), term(s), condition(s), provision(s), etc. contained in the tariff petition or any other document which are not specifically allowed/approved in this tariff determination, should not be implied to be approved, if not adjudicated upon in this tariff determination.
- ii. The above tariff and terms and conditions shall be incorporated as the specified tariff approved by the Authority pursuant to Rule 6 of the National Electric Power Regulatory Authority Licensing (Generation) Rules, 2000 in the power purchase agreement between the petitioner and the Power Purchaser.
- iii. In case the company earns annual profit in excess of the approved return on equity (including ROEDC), then that extra amount shall be shared between the power producer and consumers through claw back mechanism to be decided by the Authority at the time of COD.
- iv. Pre COD sale of electricity is allowed to the project company, subject to the terms and conditions of EPA, at the applicable tariff excluding debt servicing and return on equity





components. However, pre COD sale will not alter the required commercial operations date stipulated by the EPA in any manner.


- v. In case the company is obligated to pay any tax on its income from generation of electricity, or any duties and/or taxes, not being of refundable nature, are imposed on the company, the exact amount paid by the company on these accounts shall be reimbursed on production of original receipts. This payment shall be considered as a pass-through payment. However, withholding tax on dividend shall not be a pass through item.
- vi. Hydrological Risk shall be borne by the Power Producer.


22 The order along with reference tariff table and debt service schedule as attached thereto are recommended for notification by the Federal Government in the official gazette in accordance with Section 31(7) of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997.


**AUTHORITY**

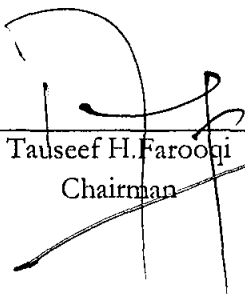
~~NOT ATTENDED~~

Engr. Bahadur Shah  
Member

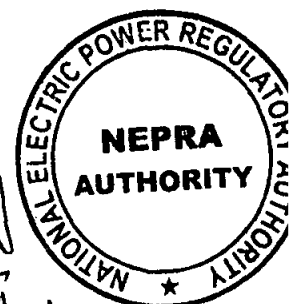
  
Engr. Rafique Ahmed Shaikh  
Member

  
31/12/2020  
Rehmatullah Baloch  
Member

  
Saif Ullah Chattha  
Vice Chairman 30.12.2020

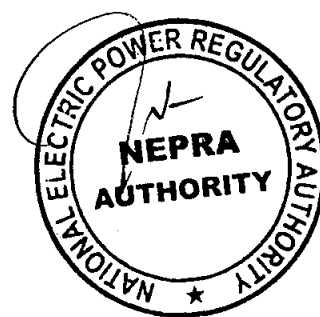
  
Tauseef H. Farooqi  
Chairman

[20]



**KARORA HYDROPOWER PROJECT  
REFERENCE TARIFF TABLE**

Year	V.O&M Local	Fixed O&M Foreign	Fixed O&M Local	Insurance	ROEDC	ROE	Debt Servicing		Total PKR/Kwh
							Principal	Interest	
	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	Rs./kWh	
1	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.5116	3.8060	7.2850
2	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.5496	3.7679	7.2850
3	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.5905	3.7271	7.2850
4	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.6344	3.6832	7.2850
5	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.6815	3.6360	7.2850
6	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.7322	3.5854	7.2850
7	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.7866	3.5310	7.2850
8	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.8451	3.4725	7.2850
9	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.9079	3.4097	7.2850
10	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	0.9754	3.3422	7.2850
11	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.0479	3.2697	7.2850
12	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.1258	3.1918	7.2850
13	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.2095	3.1081	7.2850
14	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.2994	3.0182	7.2850
15	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.3960	2.9216	7.2850
16	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.4997	2.8178	7.2850
17	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.6112	2.7064	7.2850
18	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.7310	2.5866	7.2850
19	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.8597	2.4579	7.2850
20	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	1.9979	2.3197	7.2850
21	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	2.1464	2.1712	7.2850
22	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	2.3059	2.0116	7.2850
23	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	2.4773	1.8402	7.2850
24	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	2.6615	1.6561	7.2850
25	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	2.8593	1.4583	7.2850
26	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	3.0719	1.2457	7.2850
27	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	3.3002	1.0174	7.2850
28	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	3.5455	0.7721	7.2850
29	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	3.8091	0.5085	7.2850
30	0.1063	0.5741	0.3828	0.4313	0.2226	1.2502	4.0922	0.2254	7.2850
<b>Levelized Tariff</b>	<b>0.1063</b>	<b>0.5741</b>	<b>0.3828</b>	<b>0.4313</b>	<b>0.2226</b>	<b>1.2502</b>	<b>1.0731</b>	<b>3.2445</b>	<b>7.2850</b>



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Karora Hydropower Project  
Debt Servicing Schedule (Local)

Annex-II

Period	Opening Balance US\$	Mark-UP US\$	Principal Repayment US\$	Debt Service Million US\$	Annual Principal Repayment-Rs./kWh	Annual Interest Rs./kWh	Annual Debt Servicing Rs./kWh
	23,200,874	846,831.92	111,524	958,356			
	23,089,350	842,761.29	115,595	958,356	0.5116	3.8060	4.3176
1	<b>23,200,874</b>	<b>1,689,593</b>	<b>227,119</b>	<b>1,916,712</b>	<b>0.5116</b>	<b>3.8060</b>	<b>4.3176</b>
	22,973,756	838,542.08	119,814	958,356			
	22,853,942	834,168.88	124,187	958,356	0.5496	3.7679	4.3176
2	22,973,756	1,672,711	244,001	1,916,712	0.5496	3.7679	4.3176
	22,729,755	829,636.05	128,720	958,356			
	22,601,035	824,937.77	133,418	958,356	0.5905	3.7271	4.3176
3	22,729,755	1,654,574	262,138	1,916,712	0.5905	3.7271	4.3176
	22,467,617	820,068.01	138,288	958,356			
	22,329,329	815,020.50	143,335	958,356	0.6344	3.6832	4.3176
4	22,467,617	1,635,089	281,623	1,916,712	0.6344	3.6832	4.3176
	22,185,993	809,788.76	148,567	958,356			
	22,037,426	804,366.05	153,990	958,356	0.6815	3.6360	4.3176
5	22,185,993	1,614,155	302,557	1,916,712	0.6815	3.6360	4.3176
	21,883,436	798,745.42	159,611	958,356			
	21,723,826	792,919.64	165,436	958,356	0.7322	3.5854	4.3176
6	21,883,436	1,591,665	325,047	1,916,712	0.7322	3.5854	4.3176
	21,558,389	786,881.21	171,475	958,356			
	21,386,915	780,622.39	177,734	958,356	0.7866	3.5310	4.3176
7	21,558,389	1,567,504	349,208	1,916,712	0.7866	3.5310	4.3176
	21,209,181	774,135.11	184,221	958,356			
	21,024,960	767,411.05	190,945	958,356	0.8451	3.4725	4.3176
8	21,209,181	1,541,546	375,166	1,916,712	0.8451	3.4725	4.3176
	20,834,015	760,441.56	197,914	958,356			
	20,636,101	753,217.69	205,138	958,356	0.9079	3.4097	4.3176
9	20,834,015	1,513,659	403,053	1,916,712	0.9079	3.4097	4.3176
	20,430,963	745,730.14	212,626	958,356			
	20,218,337	737,969.30	220,387	958,356	0.9754	3.3422	4.3176
10	20,430,963	1,483,699	433,012	1,916,712	0.9754	3.3422	4.3176
	19,997,950	729,925.19	228,431	958,356			
	19,769,520	721,587.46	236,768	958,356	1.0479	3.2697	4.3176
11	19,997,950	1,451,513	465,199	1,916,712	1.0479	3.2697	4.3176
	19,532,751	712,945.41	245,411	958,356			
	19,287,341	703,987.93	251,368	958,356	1.1258	3.1918	4.3176
12	19,532,751	1,416,933	499,779	1,916,712	1.1258	3.1918	4.3176
	19,032,973	694,703.50	263,652	958,356			
	18,769,320	685,080.18	273,276	958,356	1.2095	3.1081	4.3176
13	19,032,973	1,379,784	536,928	1,916,712	1.2095	3.1081	4.3176
	18,496,044	675,105.62	283,250	958,356			
	18,212,794	664,766.98	293,589	958,356	1.2994	3.0182	4.3176
14	18,496,044	1,339,873	576,839	1,916,712	1.2994	3.0182	4.3176
	17,919,205	654,050.98	304,305	958,356			
	17,614,900	642,943.85	315,412	958,356	1.3960	2.9216	4.3176
15	17,919,205	1,296,995	619,717	1,916,712	1.3960	2.9216	4.3176
	17,299,488	631,431.31	326,925	958,356			
	16,972,563	619,498.56	338,857	958,356	1.4997	2.8178	4.3176
16	17,299,488	1,250,930	665,782	1,916,712	1.4997	2.8178	4.3176
	16,633,706	607,130.27	351,226	958,356			
	16,282,480	594,310.53	364,045	958,356	1.6112	2.7064	4.3176
17	16,633,706	1,201,441	715,271	1,916,712	1.6112	2.7064	4.3176
	15,918,435	581,022.87	377,333	958,356			
	15,541,102	567,250.21	391,106	958,356	1.7310	2.5866	4.3176
18	15,918,435	1,148,273	768,439	1,916,712	1.7310	2.5866	4.3176
	15,149,996	552,974.85	405,381	958,356			
	14,744,615	538,178.44	420,178	958,356	1.8597	2.4579	4.3176
19	15,149,996	1,091,153	825,559	1,916,712	1.8597	2.4579	4.3176
	14,324,437	522,841.97	435,514	958,356			
	13,888,923	506,945.71	451,410	958,356	1.9979	2.3197	4.3176
20	14,324,437	1,029,788	886,924	1,916,712	1.9979	2.3197	4.3176
	13,437,513	490,469.23	467,887	958,356			
	12,969,626	473,391.37	484,965	958,356	2.1464	2.1712	4.3176
21	13,437,513	963,861	952,851	1,916,712	2.1464	2.1712	4.3176
	12,484,662	455,690.16	502,666	958,356			
	11,981,996	437,342.86	521,013	958,356	2.3059	2.0116	4.3176
22	12,484,662	893,033	1,023,679	1,916,712	2.3059	2.0116	4.3176
	11,460,983	418,325.88	540,030	958,356			
	10,920,953	398,614.78	559,741	958,356	2.4773	1.8402	4.3176
23	11,460,983	816,941	1,099,771	1,916,712	2.4773	1.8402	4.3176
	10,361,212	378,184.23	580,172	958,356			
	9,781,040	357,007.96	601,348	958,356	2.6615	1.6561	4.3176
24	10,361,212	735,192	1,181,520	1,916,712	2.6615	1.6561	4.3176
	9,179,692	335,058.76	623,297	958,356			
	8,556,395	312,308.42	646,048	958,356	2.8593	1.4583	4.3176
25	9,179,692	647,367	1,269,345	1,916,712	2.8593	1.4583	4.3176
	7,910,347	288,727.68	669,628	958,356			
	7,240,719	264,286.25	694,070	958,356	3.0719	1.2457	4.3176
26	7,910,347	553,014	1,363,698	1,916,712	3.0719	1.2457	4.3176
	6,546,649	238,952.70	719,403	958,356			
	5,827,246	212,694.49	745,661	958,356	3.3002	1.0174	4.3176
27	6,546,649	451,647	1,465,965	1,916,712	3.3002	1.0174	4.3176
	5,081,585	185,477.84	772,878	958,356			
	4,308,707	157,267.79	801,088	958,356	3.5455	0.7721	4.3176
28	5,081,585	342,746	1,573,966	1,916,712	3.5455	0.7721	4.3176
	3,507,618	128,028.07	830,328	958,356			
	2,677,291	97,721.11	860,635	958,356	3.8091	0.5085	4.3176
29	3,507,618	225,749	1,690,963	1,916,712	3.8091	0.5085	4.3176
	1,816,656	66,307.94	892,048	958,356			
	924,608	33,748.18	924,608	958,356	4.0922	0.2254	4.3176
30	1,816,656	100,056	1,816,656	1,916,712	4.0922	0.2254	4.3176



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