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National Electric Power Regulatory Authority
Registrar Office

No: NEPRA/R/TRF-100/UHPCO/4251

February 6, 2020


Subject: Submission of the Feasibility Stage Tariff Petition of 82.25 MW Turtonaz-Uzghor Hydro Power Project, Golen Gol, Chitral, Khyber Pakhtunkhwa

Please find enclosed herewith the subject tariff petition submitted by Uzghor Hydro Power Company (Pvt) Ltd vide letter No. UHPCO/NEPRA/TUHPP/2020/001 dated 03.02.2020 (received on 04.02.2020) for determination of EPC Stage Tariff for its 82.25 MW Turtonaz-Uzghor Hydro Power Project, Golen Gol, Chitral, Khyber Pakhtunkhwa.

2. The deficient information in the subject tariff petition, if any, shall be classified that it is required under Rule 3(2) & (8) of NEPRA (Tariff Standards & Procedure) Rules, 1998 (Tariff Rules) or an additional information is required under Rule 4(2) of the Tariff Rules.
3. The Senior Advisor (Tariff), Senior Advisor (Tech), and Legal Advisor (KIP) are requested to provide their comments that whether the provided information / documents by PEDO are complete as per the requirements of Tariff Rules for admission or highlight / mention the shortcomings, if any, which may cause non-admission of the subject petition.
4. The requisite comments may kindly be provided by 08.02.2020 for further necessary action in the matter, please.

 6/2/20
Director
Registrar Office

1. SA (Tech)
- ✓ 2. SA(T)
3. LA (KIP)

DDT-II 

For Information:

1. Registrar
2. Assistant Registrar (Tariff) [to pursue]
3. Master File

BEHFOR AGYISOR IAYIT-1
By No. 1232
Date 6-2-20



Uzghor Hydro Power Company (Pvt.) Ltd

UHPCO

Ref No: UHPCO/NEPRA/TUHPP/2020/001

Dated: February 3, 2020

The Registrar

National Electric Power Regulatory Authority (NEPRA)

NEPRA Tower Attaturk Avenue (East)

Sector G-5/1,

Islamabad.

For information & info pl
 — DROI / 10/19-I
 G. K. B.
 — SA (Tech) — SAT-II
 — DG (MSD) — ADG (L-1)
 — LA (EP) — MF
 04/2/20
 Chairman
 VC
 m(T)
 m(C)
 m(L-1)

Subject: Submission of the Feasibility Stage Tariff Petition of 82.25 MW Turtonas-Uzghor Hydro Power Project, Golen Gol, Chitral, Khyber Pakhtunkhwa

I, Abdul Karim Qureshi, Chief Executive Officer, being the duly authorized representative of the Uzghor Hydro Power Company (Private) Limited ("UHPCO") by virtue of board resolution dated 22nd January 2020, hereby submit this application for the feasibility stage tariff of the subject mentioned Project and request National Electric Regulatory Authority ("NEPRA" or "Authority") approval.

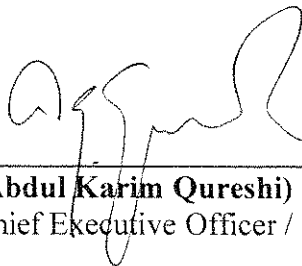
I certify that the documents in support attached with this Application are prepared and submitted in conformity with the provisions of NEPRA (Tariff Standard and Procedures) Rules, 1998 and undertake to abide by the terms and provision of the above-said rules. I further undertake and confirm that the information provided in the attached tariff petition is true and correct to the best of knowledge and belief.

It is further submitted that Tariff Petition for the subject Project was earlier submitted to NEPRA on June 25th 2019, which was processed as Case No. NEPRA/R/TRF-100/SCL; however, the Authority vide its Letter No. NEPRA/R/TRF-100/SCL/21627 dated 29.10.2019 returned the petition due to non-submission of documents pertaining to project company registration in Pakistan. Also it was intimated that guidance of the Authority will be sought as to whether the fee earlier submitted by Sponsors with that petition may be adjusted for this fresh petition; and the Sponsors will be informed accordingly.

Since there has been no intimation from NEPRA, the fresh petition/application is being submitted by UHPCO without any fee on the presumption that the Authority has very magnanimously allowed to adjust the earlier deposited fee by the Sponsors for this fresh petition.

I hereby request the Authority for kind consideration and favorable approval of our tariff petition by the Authority in accordance, *inter alia*, with Section 31 of the Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997 read with Rule 3 of the NEPRA Tariff Standards and Procedure Rules, 1998 and other applicable provisions of NEPRA law.

Yours Sincerely,





(Abdul Karim Qureshi)
Chief Executive Officer / Authorized Representative

Encl: As stated above.

Cc:
- Master File.

REGISTRAR
 Dr. No: 2176
 Date: 04-02-20

The Tariff Petition (including the following Annexures) is submitted in triplicate together with:

1. Proposed 30 Year Tariff (Annexure 1)
2. Debt Repayment Schedule (Annexure 2)
3. Board Resolution of Uzghor Hydro Power Company (Pvt.) Limited; dated 22nd January, 2020 (Annexure 3)
4. Affidavit of Mr. Abdul Karim Qureshi; dated February 3rd, 2020 (Annexure 4)
5. Copies of Bank Draft (Annexure 5)
6. Letter of Intent (LOI) issued by PPIB (Annexure 6)
7. Feasibility Study approval by Panel of Experts & PPIB (Annexure 7)
8. NTDC waiver to Sponsors from conducting Project Specific Interconnection Study (Annexure 8)
9. CPPA and PESCO letters regarding Interconnection Study (Annexure 9)
10. Company Incorporation Certificate (Annexure 10)
11. Article & Memorandum of Association of the Company (Annexure 11)



BEFORE
NATIONAL ELECTRIC POWER REGULATORY AUTHORITY (NEPRA)

FEASIBILITY STAGE TARIFF PETITION

ON BEHALF OF
UZGHOR HYDRO POWER COMPANY (PRIVATE) LIMITED

FOR
TURTONAS-UZGHOR HYDROPOWER PROJECT
82.25 MW (GROSS CAPACITY)

LOCATED AT
GOLEN GOL, DISTRICT CHITRAL, KPK
(THE "PROJECT")

3RD FEBRUARY, 2020

PETITIONER DETAILS:

Uzghor Hydro Power Company (Private) Limited
59-E, Street 7, Sector I-10/3, Islamabad, Pakistan
Ph No: 051-4436004; Fax No: 051-4431774
E-mail: uhpco58@gmail.com



LIST OF ABBREVIATIONS

| | |
|-----------|---|
| BOQ | Bill of Quantities |
| COD | Commercial Operations Date |
| CDM | Clean Development Mechanism defined in Kyoto Protocol (IPCC,2007) |
| CPP | Capacity Purchase Price |
| CPPA | Central Power Purchasing Agency (Guarantee) Limited |
| DISCO | Distribution Company |
| E&M | Electrical & Mechanical |
| EPC | Engineering Procurement & Construction |
| Fichtner | Fichtner GmbH, Germany |
| GOP | Government of Pakistan |
| GW | Gigawatt |
| GWh | Gigawatt hour; (1,000,000 kilowatt hours) |
| HPP | Hydropower Project |
| Hrs. | Hours |
| IA | Implementation Agreement |
| IDC | Interest During Construction |
| IPP | Independent Power Producer |
| IRR | Internal Rate of Return |
| JV | Joint Venture |
| KIBOR | Karachi Interbank Offered Rate |
| KPK | Khyber Pakhtunkhwa |
| KW | Kilowatt |
| KWh | Kilowatt hour |
| LIBOR | London Interbank Offered Rate |
| LOI | Letter of Intent |
| m | Meter(s) |
| MW | Mega Watt (1000 kilowatts) |
| NEPRA | National Electric Power Regulatory Authority of Pakistan |
| NEPRA Act | Regulation for Generation, Transmission and Distribution of Electric Power Act (XL of) 1997 |
| NBP | National Bank of Pakistan |
| No. | Number |
| NTDC | National Transmission & Despatch Company Limited |



| | |
|----------|--|
| O&M | Operation & Maintenance |
| PBS | Pakistan Bureau of Statistics |
| PKR | Pakistan Rupee |
| POE | Panel of Experts |
| PPA | Power Purchase Agreement |
| PPIB | Private Power Infrastructure Board |
| ROE | Return on Equity |
| ROEDC | Return on Equity During Construction |
| Sponsors | Sinohydro Corporation Limited & Sachal Engineering Works Pvt. Ltd. |
| SROE | Special Return on Equity |
| TEAM | Technical Engineering and Management (Pvt.) Ltd., Pakistan |
| TL | Transmission Line |
| UHPKO | Uzghor Hydro Power Company (Private) Limited |
| USc | United States cent |
| USD | United States Dollar |
| US CPI | United States Consumer Price Index |
| WUC | Water Use Charges |
| WHT | Withholding Tax |



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1. GROUNDS OF PETITION

This Petition is made under the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of) 1997 as amended from time to time (the "NEPRA Act"), to the National Electric Power Regulatory Authority ("NEPRA") and the Tariff Standards and Procedure Rules, 1998 (the "NEPRA Rules") under the NEPRA Act; and other applicable laws.

In order to cater to the unique nature of hydropower plants, wherein cost uncertainty due to a long gestation period is neither in the control of the Petitioner nor the Power Purchaser, NEPRA has developed a Mechanism for Determination of Tariff for Hydropower Projects (the "Mechanism"). The Mechanism provides for determination of tariff and subsequent adjustments at different stages of development of hydropower projects. In this respect three distinct stages have been identified in the Mechanism:

- i. Feasibility stage;
- ii. EPC stage; and
- iii. Final cost stage (at Commercial Operation Date ("COD")).

This Petition is intended to provide a basis for NEPRA to render a tariff determination, which is applicable to the Feasibility stage. Subsequent tariff determinations will be made in accordance with the Mechanism at a future date.

Pursuant to an application and statement of qualification submitted to Private Power and Infrastructure Board (the "PPIB"), the Consortium of M/s Sinohydro Corporation Limited & M/s Sachal Engineering (Private) Limited (Main Sponsors/Sponsors) on 20.04.2016, PPIB through its letter #1(101) PPIB/2051-02/17/PRJ/0-48530/1 (20.03.2017) granted Consortium, a Letter of Intent (the "LOI") under Power Generation Policy 2015.

As per the terms of the LOI, a feasibility study was required to be submitted for the development of the Turtonas-Uzghor Hydropower Project (the "Feasibility Study"). The Feasibility Study contains a detailed analysis of the technical and financial aspects of the Project which was thoroughly reviewed and approved by the Panel of Experts / PPIB through its letter # 1(101)PPIB-2051-02/19/PRJ/0-53088. In view of POE approval, it is respectfully submitted that NEPRA base its tariff determination on the conclusions set out in the Feasibility Study.

Pursuant to the relevant provisions of the NEPRA Act, read with the provisions of the Rules and Regulations made thereunder and in accordance with the Power Generation Policy 2015 (the "Policy"), Uzghor Hydro Power Company (Private) Limited (the "Project Company") submits herewith before NEPRA, for its approval, this tariff petition (the "Tariff Petition") for approval of:

- i. the Reference Generation Tariff (the "Reference Generation Tariff");
- ii. the Project Cost
- iii. the Energy Production Estimate
- iv. the Indexations, Adjustments and Escalations
- v. Tariff Reopeners; and other matters set out in this Tariff Petition

(in each case, for the Company's power generation Project to be located at Golen Gol, District Chitral, Khyber Pakhtunkhwa).

NEPRA is kindly requested to process the Tariff Petition at the earliest, thereby enabling the Company to proceed further with the development process.



2. EXECUTIVE SUMMARY

Based on the assumptions contained in this Tariff Petition, please find below a summary of the project ("Project"):

Table 1:

| | | |
|----------------------------------|---|--|
| Project Company | Uzghor Hydro Power Company (Private) Limited ("UHPCO") | |
| Project Name | Turtonas-Uzghor Hydropower Project ("TUHPP") | |
| Project Location | Golen Gol, District Chitral, KPK | |
| Installed Capacity | 82.25 MW | |
| Auxiliary Consumption | 0.822MW | |
| Plant Capacity (Net) | 81.428MW | |
| Energy Production (Gross) | 382.30 GWh | |
| Energy Production (Net) | 378.47 GWh | |
| Plant Factor | 53.06% | |
| Implementing Agency | Private Power & Infrastructure Board ("PPIB") | |
| Concession Period | 30 Years from COD | |
| Power Purchaser | Central Power Purchasing Agency on behalf of DISCO's | |
| Estimated Project Cost | USD 204.602Million | |
| Funding Plan | Debt 80% : Equity 20% | |
| Equity | USD 40.92 Million | |
| Long term Debt | USD 163.68 Million | |
| Lenders | A syndicate of international development financial institutions, local and international banks and financial institutions (including Chinese banks / financial institutions). | |
| Terms of Long Term Debt | Currency (expected) | Mix of Foreign Currency USD and Pakistan Rupees |
| | Term | Upto 16 years including Grace Period (door to door) |
| | Grace Period | Up to 48 months |
| | Repayment Period | 12 Years |
| | Debt Repayment | Quarterly |
| | Interest Rate | 3 months KIBOR + 275 bps 3 months LIBOR + 460 bps |



| | |
|--------------------------------|---|
| Levelized Tariff | 7.9205 US cents / kWh |
| Reference Exchange Rate | 1 USD = PKR 123.60 |
| Concession Documents | <ul style="list-style-type: none"> ▪ Power Purchase Agreement with the CPPA-G (Power Purchaser) ▪ Water Usage Agreement with Government of Khyber Pakhtunkhwa ▪ Implementation Agreement with the President of Pakistan through PPIB ▪ Government of Pakistan Guarantee |
| Applicable GOP Policy | Power Generation Policy, 2015 |

Table 2: Project Technical Information:

| Hydrological Features at Weir Site: | | |
|--|---------|-------------------|
| Catchment Area of Golen Gol | 518 | km ² |
| Mean Annual Flow | 18.86 | m ³ /s |
| HQ _{1,000} | 1,025 | m ³ /s |
| Weir Structure: | | |
| Crest Level of Weir | 2582 | m SoP |
| Max. Weir Height | 8.3 | m above river bed |
| Length of Weir Crest | 40.0 | m |
| Invert of Flushing Outlet | 2574.44 | m SoP |
| Spillway: | | |
| Level of Spillway Crest | 2582 | m SoP |
| Desander/Sedimentation Basin: | | |
| Design Discharge | 20.0 | m ³ /s |
| Design Particle Diameter | 0.20 | mm |
| Number of settling chambers | 3 | |
| Effective length of chamber | 91.27 | m w/o transition |
| Total Width of chamber | 25.3 | m |
| Average depth of chamber | 8.5 | m |



| | | |
|---|--------------------|-------------------|
| Low-pressure Headrace Tunnel: | | |
| Length | 4.837 | Km |
| Net Diameter | 4 | m |
| Max. Flow velocity | 2.7 | m/s |
| Surge Tank: | | |
| Diameter: | 15.00 | m |
| Pressure Shaft and High-Pressure Tunnel: | | |
| Length of vertical shaft | 440.1 | m |
| Diameter | 2.5 | concrete lined |
| Diameter | 2.5 | steel lined |
| Steel lining | 20 - 28 | mm |
| Powerhouse: | | |
| No. of units | 2 | Pelton |
| Capacity each unit | 41.125 | MW |
| Installed Capacity | 2 x 41.125 = 82.25 | MW |
| Max. Turbine Design Discharge | 20 | m ³ /s |
| Plant Factor | 53.06 | % |
| Electro-mechanical Equipment: | | |
| No of Transformers | 2 | |
| Type of GIS Switchyard | SF6 | |
| Voltage | 132 | KV |
| Tailrace Tunnel: | | |
| Total length (w/ manifold) | 75 | m |
| Mean Annual Energy (Gross) | 382 | GWh |



3. THE PROJECT BACKGROUND

Turtonas-Uzghor Hydropower Project (the "Project") is located on River Golen Gol which is a left bank tributary of Mastuj River. It joins with Mastuj River about 22 km north-east of Chitral Town near village of Kaghozi. The identified weir site on Golen Gol is approx. 8 km upstream of the existing Golen Gol Hydropower Project intake. The power house site is proposed on the right bank of Golen Gol River near Uzghor Village just upstream of Golen Gol HPP intake. The powerhouse site is located north-east of Chitral Town at a distance of about 33 km. The project has the capacity of 82.25 MW and will generate 382.33 GWh of energy annually. Two Pelton type Turbines with vertical shaft design would be installed.

This project site was first identified by PEDO-GTZ under Comprehensive Planning of Hydropower Resources in Khyber Pakhtunkhwa Province (1987-92). GTZ in collaboration with Sarhad Hydrel Development Organization (SHYDO) undertook the Comprehensive Planning of Hydropower Resources of Khyber Pakhtunkhwa Province along small streams and tributaries of main rivers flowing in the Province. This potential has been documented in Regions of Upper Chitral, Lower Chitral, Upper Swat, Lower Swat, Upper Kohistan, Lower Kohistan and Manshera, etc. The GTZ/SHYDO presented their report "Identification of Hydropower Development Potential in Chitral Valley" in February 2001. The Turtonas-Uzghor Hydropower Project was part of the identified projects presented in the report. The tentative salient features of the Project were as under:

| | |
|-------------------------|-----------------------------------|
| Project Name | Turtonas-Uzghor Hydropower |
| River | Golen Gol |
| Distance | 33 Km from Chitral Town |
| Status | Raw Site |
| Type of Project | Run of River |
| Design Discharge | 20.0 m ³ /s |
| Gross Head | 351 m |
| Design Capacity | 58MW |

After the restructuring of power sector in Pakistan, the Project was later taken over by PPIB and offered to private sector investors. The Sponsors was awarded the LOI by PPIB, after an international competitive selection process in March. 2017.

Based on aforementioned reports, studies and extensive site visits; the Feasibility Report for Turtonas-Uzghor Hydro Power Project has subsequently been prepared by a joint venture comprises of M/S Technical, Engineering and Management (TEAM) Consultants, Pakistan and FICHTNER GmbH, Germany, (collectively, "Feasibility Consultant").

The Consultant conducted a number of studies and analyzed all the Project components viz weir, access channel, sedimentation basin, spillway, tunnel, surge chamber, penstock, tailrace channel and powerhouse including their sizing.



The Consultant, from time to time, submitted reports and gave presentations on core activities of the Feasibility Study to the Panel of Experts (POE). The POE's valuable observations and comments on the technical and financial aspects of the Project were duly acknowledged, evaluated and incorporated into the final / POE approved version of the Feasibility Study. It is, therefore, respectfully submitted that the Feasibility Study should form the basis of the proposed tariff determination under this Petition and that the findings and conclusions set out in the Feasibility Study should be incorporated in the said tariff determination.

A chronology of the Project till Approval of Feasibility Study by Panel of the Experts is provided below:

Table 2: Chronology till Feasibility approval

| Date | Details |
|------------|---|
| 20-04-2016 | Submission of Qualification Documents for the Project invited by PPIB |
| 13-12-2016 | Notification of Qualification by PPIB |
| 20-03-2017 | Letter of Intent (LOI) issued by PPIB |
| 10-08-2017 | 1st Panel of Expert Meeting |
| 12-10-2017 | 2nd POE Meeting - Submission of Interim Report |
| 06-04-2018 | 3rd POE Meeting - Submission of Draft Feasibility Study Report |
| 13-12-2018 | 4th POE Meeting - Revised Draft of Feasibility Study Report |
| 15-03-2019 | 5th POE Meeting - Discussion on Draft of Feasibility Study Report |
| 09-05-2019 | 6th POE Meeting - PPIB/POE concluded that it is technically feasible and economically viable to develop 82.25 MW hydropower scheme at Turtonas-Uzghor Hydropower Project. |



4. PROJECT BENEFITS

Apart from being a power generation project based on indigenous resources, the Project has various additional advantages:

- Project would provide economical and reliable electricity to the national grid.
- Hydroelectric plants cheaper electricity for longer term. These plants have a typical operational life of 70-90 years.
- After completion of 30-year term, the Project, having substantial residual technical and economic life, shall be transferred to the GOKPK at a notional value of Rupee 1.
- Hydropower generating units allow better use of system load management.
- Project will generate employment for local population.
- Economic opportunities will be generated in the local area and in Pakistan for subcontracts, suppliers etc.
- The Project will also provide low cost power and will have consequential long-term benefits for the national economy. In addition to electricity generation and foreign exchange savings through eliminating the need for fuel imports (as in the case of an alternative option) this project will also create employment opportunities for the local population and will promote development of ancillary business activity.
- Pakistan has been pre-dominantly reliant on conventional thermal sources for generation of electricity which has *inter alia* adversely affected the economy as well as the environment. Energy generation through renewable sources such as water, wind and solar is the way forward for the optimization of energy mix. Among the renewables, hydropower is the most economical resource in longer run for generation of power. Moreover, among the renewable's hydropower has the added advantage of being used as baseload source of power generation.
- The Province will earn revenue in the shape of water use charges for 30 years.
 - ❖ Rs. 160 Million annually for 30 years on account of Water Usage Charges (the "WUC") (which translates to per day income of around Rs. 0.438 Million for KPK) – Rs. 4.80 Billion over 30 years.



5. ABOUT THE APPLICANT & PROJECT SPONSORS

5.1 The Applicant

In order to implement the proposed 82.25 MW Turtonas Uzghor Hydro Power Project, a new Special Purpose Vehicle Company ("SPVC") with the name of Uzghor Hydro Power Company (Private) Limited, was incorporated in Pakistan and registered with SECP on January 01, 2020. The Project Company will build, own and operate the Complex till the expiry of the stipulated thirty (30) year Term of the Power Purchase Agreement ("PPA"). Thereafter the Complex will be handed over to the representative of the Government of Khyber Pakhtunkhwa ("GOKPK") in accordance with the provisions of the Implementation Agreement(s) ("IA") to be entered into between UHPCO and various counter parties, in due course.

5.2 The Project Sponsors

5.2.1 Sinohydro Corporation Limited (Main Sponsor)

Sinohydro Corporation Limited ("Sinohydro") is a wholly state-owned enterprise with a registered capital of RMB four Billion. Sinohydro is strategically positioned as a clean energy conglomerate specializing in development and operation of large-scaled hydropower projects. Sinohydro's principal operations include engineering, construction, management, electricity production and provision of related technical services for hydropower projects.

Founded in the early 1950s, Sinohydro is originally well known as China's first brand in hydropower construction, responsible for 65% of the large- and medium-scale hydropower stations in the country. However, after 60 years of expansion and development, Sinohydro has become a global enterprise, running diversified businesses from water conservancy and hydropower construction to project financing, design, implementation and operation in almost all kinds of infrastructures such as power, transportation, civil work, mining and real estate.

The recent decade has witnessed Sinohydro's rapid growth in business revenue, asset volume and asset structure diversification. Currently, the company has 524 international projects in more than 74 countries, with total contract value of nearly USD 42.50 billion.

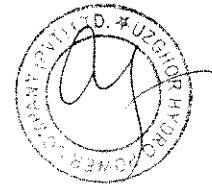
5.2.2 Sachal Engineering Works (Pvt.) Ltd. (Sponsor)

Sachal Engineering Works (Pvt.) Ltd. ("SEWPL") ("Sachal") was formed as a partnership concern in 1972 and later converted to a private limited company in 1990. The company is a leading construction and civil engineering company which has been involved in the construction of various bridges, road works and civil works for hydropower projects. SEWPL holds a License of Pakistan Constructor/ Operator from the Pakistan Engineering Council. Sachal is considered a ("CA") category construction company whereby there is no restriction on the capital cost of any project undertaken. Sachal is one of the leading transportation infrastructure contractors in Pakistan, developing innovative solutions to build roads, highways, interchanges and bridges for both public and private clients.



Seeing the vast potential present in the hydro power generation, Sachal ventured into private power generation on Build Own Operate Transfer (BOOT) basis. Riali Hydro Power Company (Private) Limited ("RHPCO") is a group concern of the company and was incorporated as a private limited company in 2012 under the Companies Ordinance, 1984. The company, in essence, is a special purpose vehicle ("SPV") to set up a Run-Off-The-River 7.08 MW Hydropower Plant near Muzaffarabad, Azad Kashmir.

Riali hydroelectric power project represent the Sachal's resolve in the green energy segment. The future lies only in developing indigenous / renewable base energy, which is abundantly available; therefore, Sachal committed and focused on developing further hydro power projects, which is also an overriding corporate priority.



6. PROJECT DESCRIPTION

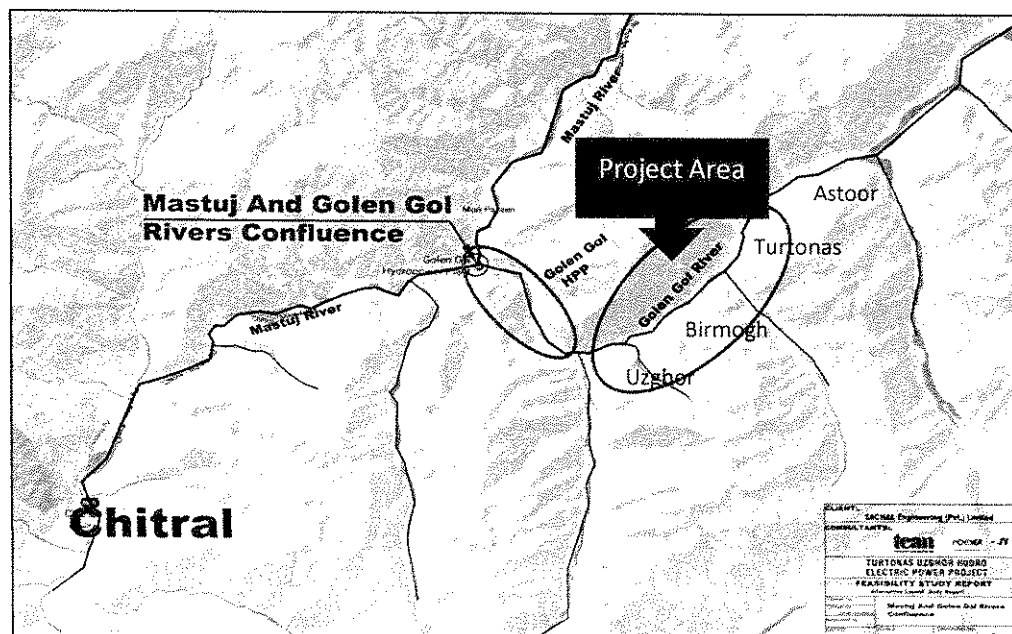
The Project envisages development, design, engineering, finance, construction, testing & commissioning, ownership, operations, maintenance and transfer of 82.25 MW Hydropower Plant on Build-Own-Operate-Transfer ("BOOT") basis in accordance with GOP's Policy for Power Generation Projects 2015, as amended from time to time.

6.1 PROJECT LOCATION

The Project is located on River Golen Gol which is a left bank tributary of Mastuj River. It joins with Mastuj River about 22 km north-east of Chitral Town near village of Kaghozi. The site is located north-east of Chitral Town at a distance of about 33 km. The identified weir site on Golen Gol is approx. 8 km upstream of the existing Golen Gol Hydropower Project intake. The power house site is proposed on the right bank of Golen Gol River near Uzghor Village just upstream of Golen Gol HPP intake. The project site is accessible from Chitral Town by truck-able road (Chitral-Buni Road) up to the confluence of Golen Gol and Mastuj River and along Golen Gol River up to the intake of Golen Gol HPP. A jeep-able road runs along Golen Gol up to the weir site. The road in the whole valley is very narrow and, in some portions, very steep also. The average speed to the weir site is not more than 10 km/h. The Project is about 475 km from Islamabad and 365 km from Peshawar.

| Area | Latitude | Longitude |
|-------------|------------------|------------------|
| Weir | 35° 56.398' | 72° 3.168' |
| Power House | 35° 55' 10.0765" | 71° 59' 33.6618" |

The Project location map is shown below:



From Islamabad, the Project site is accessible from following route:

- **By Road:** Islamabad – Nowshera – Malakand – Dir – Chitral – Project Site. **Total Distance is 475 km & travelling time via road is (12-13 hours).**
- **By air:** Islamabad – Chitral (35 mins) – Project Site (40 km, 45 mins)

6.2 PROJECT COMPONENTS

The proposed project is an entirely a run of river scheme. The layout is along the right bank of the Golen Gol River. A design discharge of 20 m³/sec has been considered based on optimization study. The difference of elevation between weir and powerhouse site was obtained from detailed topographic survey which gave a gross head of 494.1 m. The proposed layout has a weir/intake, sedimentation basin with gated spillway, access channel, headrace length of 4837 m and a provision of surface powerhouse on the right bank of river near Uzghor Village and tailrace will discharge back into the Golen Gol upstream of Diversion Weir of Golen Gol HPP.

6.3 HYDROLOGY & SEDIMENTATION

Turtonas-Uzghor Hydropower Project is a run-of-river without storage project, planned for construction at about 12 km (river) upstream of the Mastuj Bridge gauging stations. Being a run-of-river project the operation of Turtonas-Uzghor HPP will not affect the operation of the Golen Gol River in the downstream reach.

The Golen Gol River originates from a mountainous region (> 6000 m) and flows down towards south-west for about 25 km till it reaches the proposed weir site and then changes the direction towards Uzghor, where the proposed powerhouse site of the project is located.

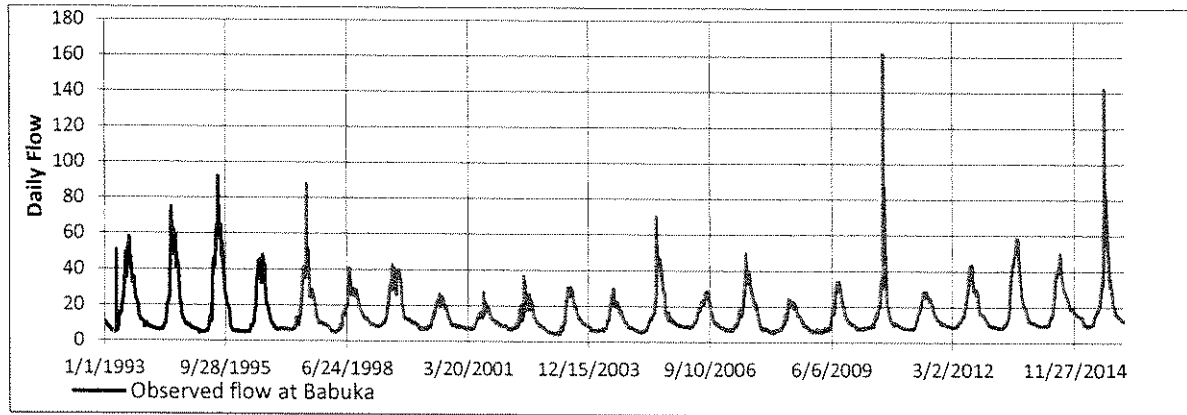
Reliable data series of 22 years are available from two gauging stations at Golen Gol river located at downstream of Project weir site. Short term stream daily flow available at 9.2 km downstream at Babuka bridge (maintained by Pakistan Meteorological Department) and 12 km downstream at Mastuj Bridge gauging stations and long-term stream flow are available at Chitral station. Both gauging station due to its characteristic of river basin similar to project area and considered very important for simulation flow at projects sites.

| River Name | Gauging Station | Basin | Installed Date | Data Source | Data Period | Total Years | Resolution | Annual Instantaneous Peak |
|------------|-----------------|---------|----------------|-------------|-------------|-------------|------------|---------------------------|
| Gloen Gol | Babuka | Chitral | 1993 | SWHP | 1993-1996 | 4 | Daily | not available |
| Gloen Gol | Mastuj Bridge | Chitral | 1996 | SWHP | 1997-2015 | 19 | Daily | Available |
| Chitral | Chitral | Kabul | 1963 | SWHP | 1964-2015 | 52 | Daily | Available |
| Swat | Kalam | Indus | 1961 | SWHP | 1961-2009 | 48 | Daily | Available |
| Kunhar | Naran | Jehlum | 1960 | SWHP | 1960-2010 | 50 | Daily | Available |
| Astore | Doyian | Indus | 1974 | SWHP | 1980-2010 | 30 | Daily | Available |
| Hunza | Dainyor Bridge | Indus | 1965 | SWHP | 1980-2010 | 30 | Daily | Available |
| Gilgit | Gilgit | Indus | 1960 | SWHP | 1980-2010 | 30 | Daily | Available |
| Lutkho | Shah-Re-sham | Chitral | | SWHP | 1987-1988 | 2 | Daily | not available |

The average annual flow recorded at Chitral station is 275.35m³/s. The average annual flows measured at Babuka and Mastuj Bridge gauging stations are 18.55m³/s (1993 -



1996) and $15.99\text{m}^3/\text{s}$ (1997-2015). Both rivers flow are mainly influenced by snowmelt, which in the region takes place from June to September. There are maximum high floods at Mastuj Bridge was reported as $212.95\text{m}^3/\text{s}$ in 24 July 2015 and $2266.4\text{m}^3/\text{s}$ was recorded at Chitral station in 28 July 2015 respectively. The total Catchment area of Chitral River at Chitral station about 11396 Km^2 and catchment area of Golen Gol River at Babuka and Mastuj Bridge stations are reported 500 and 520 Km^2 respectively.



The long-term flow computation at project site need best correlation investigation with nearby river gauging station or catchment having same climatic and geomorphic characteristic. Simulation of hydropower plant operation and the corresponding energy calculations were based on daily flow data of the available records of 52 years of Chitral gauging station which were extrapolated at Turtonas-Uzghor weir site by catchment area correlation method.

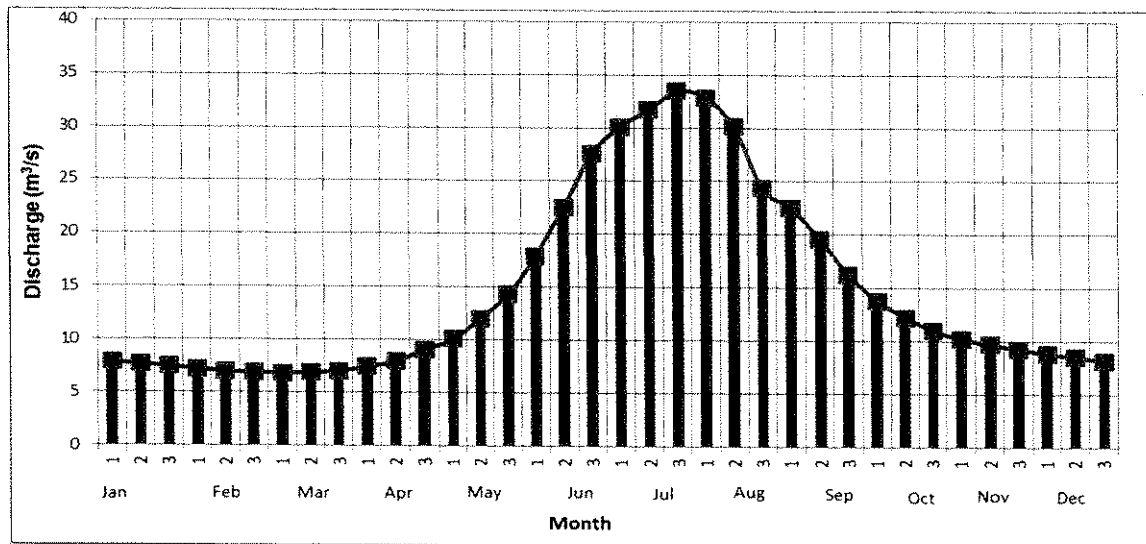
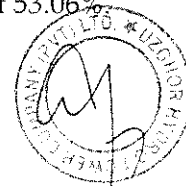


Figure 3: Mean 10-Daily Flows at Turtonas-Uzghor Weir Site

Mean annual sediment load (1964-2015) and 8% bed load at proposed weir site is of the order of 0.0486 Mt was computed.

6.4 ANNUAL GENERATION

Annual Average Energy (Gross) of 382.30 GWh has been calculated on the basis of discharges from 1964-2015 which compute Plant Load factor of 53.06%



6.5 SEISMIC HAZARD ANALYSIS

Turtonas-Uzghor hydropower project is located near the collisional zone between the Indian and the Eurasian tectonic plates. The project site is located near the contact between Kohistan island arc and the Eurasian mass represented by Shyok suture zone (MKT). The critical active tectonic features within 200 km of the project site, which governs the ground motion at the project site, are the Main Karakoram Thrust (MKT), Reshun Thrust, Tirich Mir Thrust and the Hindukush Deep Seismic Zone.

As the project is based on run-of-the-river with no reservoir, weir height is 8.3 meters and there is no chance of any downstream damage of life and property, so it can be classed as "Low Hazard Potential" as per Table B-1, Appendix-B of ER 1110-2-1806 - Earthquake Design and Evaluation for Civil Works Projects (May 2016). For seismic hazard evaluation therefore, probabilistic seismic hazard analysis (PSHA) was carried out to select the seismic design parameters.

As the Project is categorized as Low Hazard Potential Hydraulic structure, therefore for all critical structures of the project, the recommended ground motion for MDE is 0.42g. Meanwhile, for non-critical structures, the ground motion for MDE is 0.34g. OBE accelerations corresponding to 50% probability of exceedance in 100 years (i.e. a return period of 145 years) may be adopted for which PGA value is 0.24g.

6.6 GEOLOGICAL & GEOTECHNICAL STUDIES

Detailed survey, mapping and subsurface investigations of the project area have been carried out including drilling at Weir, Sedimentation Basin, Intake Portal, Tailrace and Powerhouse/Surge Shaft. Similarly, four test Pits having size of 3mx3mx5m were excavated in order to assess the ground conditions at weir site, sedimentation basin, connecting canal and tunnel portal. Samples collected from the Boreholes were subjected to laboratory tests as per latest ASTM, BS or equivalent in standards at Geotechnical Testing Laboratory of NUST Institute of Civil Engineering, National Engineering University (NUST), Sector H-12 and Construction Material Testing Laboratory, Wapda Town, Lahore. Based on these extensive studies, a clear understanding of the geological and geotechnical conditions of the Project site has been developed, which has provided sound basis for planning and design of the project structures.

Turtonas-Uzghor Hydropower project has been envisaged in an area, which is topographically characterized by rugged mountains belt and deep cut (U-shaped) canyons. The flat lands are present in the shape of minor terraces, snow avalanches, gravity related debris and narrow flood plains along Golen Gol. Altitudes range from 2150 to 2585m.a.s.l. and 4500 to 5000 m.a.s.l. along the ridge lines. Surface geological mapping covers most of the project area along Golen Gol, including the tunnel alignment at specific intervals. In the project area specifically, only two stratigraphically bedrock units are existing i.e. the Kaghozi Granite and the Reshun Formation. Kaghozi Granite is the main rock unit exposed in the area.



6.7 OPTIMIZATION AND PROJECT SIZING

The Turtonas-Uzghor Hydropower Project was initially identified by GTZ/SHYDO and presented in their report "Identification of Hydropower Development Potential in Chitral Valley" in February 2001. The tentative salient features of this Raw Site are as under:

- Project Name : Turtonas-Uzghor Hydropower Project
- River : Golen Gol
- Status : Raw Site
- Type of Project : Run of River
- Design Discharge : 20.0 m³/sec
- Gross Head : 351 m
- Design Capacity : 58 MW

Above parameters relating to head, capacity and discharge were thoroughly analyzed in the Project's Feasibility. Seven (7) number different preliminary location and layout alternatives for the project have been studied considering all feasible options with regard to the placement of various hydraulic structures and the waterway leading to the powerhouse and ultimately discharging back to the river through the tailrace at required differential. It was concluded by the Feasibility Consultant that installed capacity of 82.25MW is technically and financially viable and hence recommended for implementation at Turtonas Uzghor HPP Site.

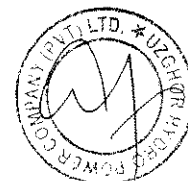
| Option | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------------------|--------|--------|---------------|--------|--------|--------|--------|
| Installed Capacity (MW) | 90.48 | 86.36 | 82.25 | 78.14 | 74.03 | 69.91 | 66.06 |
| Plant Factor (%) | 49.89 | 51.41 | 53.06 | 54.80 | 56.63 | 58.52 | 60.31 |
| Q (m ³ /sec) | 22 | 21 | 20 | 19 | 18 | 17 | 16 |
| Average Energy (GWh) | 395.41 | 388.97 | 382.33 | 375.09 | 367.21 | 358.38 | 349.03 |

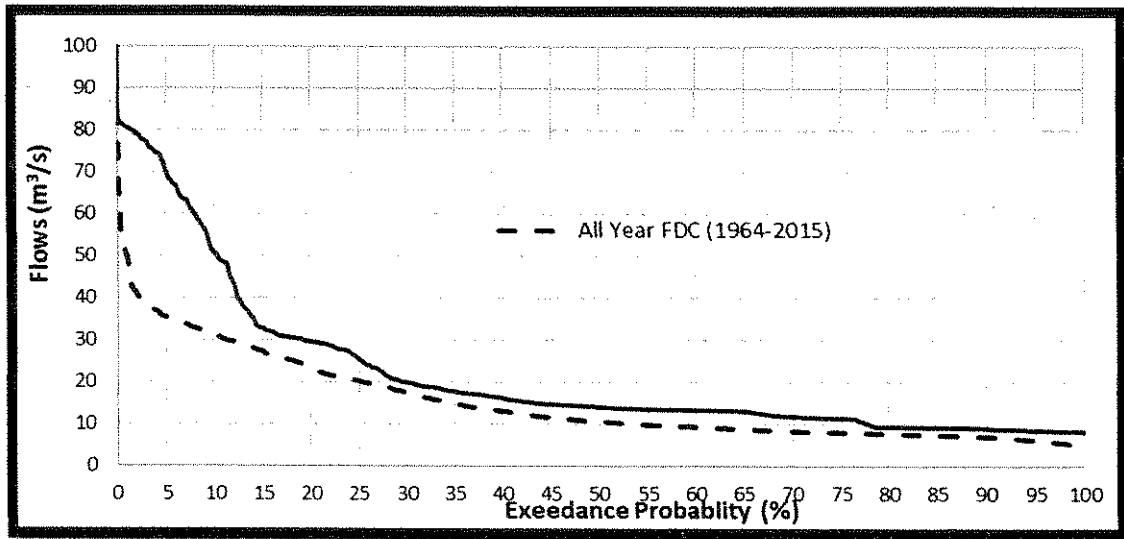
An open powerhouse at an elevation of 2087.9 masl, is proposed along right bank of the Golen Gol near Uzghor Village. Open powerhouse is the most economical solution, since sufficient space is available for construction. The proposed powerhouse location is protected from flood water levels.

The Consultant studied the installed capacity, number and individual size of turbine units. As the result, a powerhouse with two 2 identical Pelton turbine units with vertical axis are eventually recommended for Turtonas Uzghor HPP.

In view of above, Turtonas Uzghor HPP has following design parameters:

- Installed capacity of 82.25 MW with two Units of 41.125 MW capacity each;
- Discharge flow of 20 m³/s;
- Gross Head of 494m;





Flow Duration Curve at Project Site

6.8 POWER PLANT AND AUXILIARIES

Turtonas-Uzghor hydropower plant would have two Pelton hydraulic turbines (mixed flow type) of vertical shaft design. Each turbine would have a rated output of 41.125 MW at a rated discharge of 20m³/s under a rated net head of 477m. All windings of stator and rotor will be provided with a class "F" insulation system. As the long-term performance of the insulation system is affected by the maximum operating temperature of the windings, the rated output of the generators will be related to a temperature rise corresponding to class "B" insulation. The closed-cycle air-cooled generators will be equipped with air-water heat exchangers, connected to the plant cooling water system.

The main electrical equipment of the power station will comprise of the following:

- Two (2) 50 MVA generators complete with closed circuit cooling system, monitoring systems, safety devices and fire protection system
- Two (2) static excitation systems with automatic voltage regulators
- Two (2) generator bus duct systems
- Two (2) generator voltage switchgear assemblies
- Two (2) main transformers
- Three (3) station service transformers for the powerhouse

The power and speed of the generators are dictated by the turbine, with its calculated output at the shaft coupling at design heads and design flow. Considering the respective turbine power output, a typical generator efficiency of approx. 97% and a power factor of 0.85 (which allows the generation of the necessary reactive power for voltage regulation at the 132-kV grid), the respective generator design data result as follows:



| Turbine power | | |
|------------------------|-----------------|-------|
| Number of units | 2 | |
| Design according to | IEC 60034 | |
| Type of construction | IM8225(W41) | |
| P _{rated} | MW | 41.25 |
| Rated frequency | 11± | |
| Power factor | 0.85 | |
| Nominal speed | Rpm | 500 |
| Rated frequency | Hz | 50 |
| GD ² | tm ² | 392 |
| Generator power | | |
| Generator efficiency | % | 97.0 |
| nominal power factor | - | 0.85 |
| P _{S-rated} | MVA | 50 |

The rated generation voltage as selected will be 11kV, which is a typical standard voltage and appropriate for generators of this size.

Due to the limitations of transport dimensions and weights, the stator housings will be divided and delivered in sections and the winding at the joints will be completed on site. The rotor will be assembled completely at site, including stacking of the rotor rim and fixing of the poles.

Complex also include the balance of plant and various auxiliaries including, but not limited to instrumentation and control systems, switch gear, metering system, firefighting system, and miscellaneous mechanical and electrical auxiliaries.

6.9 CONSTRUCTION TIMELINES

The total construction period planned for Turtonas-Uzghor HPP is 48 months, including:

- Preparation for construction - 1 months
- Construction of main works - 45 to 46 months
- Completion and acceptance of the Project - 1 to 2 months

Construction of Headrace Tunnel is a critical activity, which will take 44 to 46 months for completion. The headrace tunnel will be constructed from both ends means from intake portal and surge tank. Headrace tunnel, Pressure tunnel will be excavated by drill and blast method and will be steel lined. Pressure shaft will be excavated by raise boring



technique. Similarly, Surge tank will be excavated from top to bottom by using drill and blast method.

Diversion weir will be constructed in two stages. In first stage, excavation and construction of divide wall including fish ladder, right abutment and under sluice will be completed. In second stage river will be diverted through under sluice by constructing upstream and downstream coffer dam. After completion of diversion and excavation, concreting of fixed weir along with left abutment will be completed. Concreting at powerhouse and sedimentation basin will be started after completion of excavation as per design drawings.

6.10 GRID INTERCONNECTION

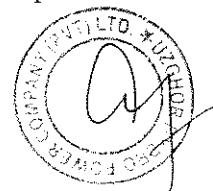
The power evacuation plan and related grid interconnection study is an important part of the feasibility study. In this regard, the Sponsors after receiving consent from PESCO and recommendation from CPPA (copies attached) have approached NTDC to issue their consent as well as necessary data of nearby grid availability in order to conduct the project specific grid interconnection/load flow study. The NTDC which is also the member of Project Panel of Experts ("POE"), after several deliberations with the sponsors as well as during POE meetings, informed the sponsors/other POE members that due to limited availability of power evacuation corridor in Chitral region, the Project Sponsors do not require to conduct project specific interconnection study, as NTDC will conduct integrated interconnection study for the purpose of power evacuation from upcoming hydropower projects in Chitral corridor. Turtoans-Uzghor hydropower project will also be part of integrated interconnection study.

However, it is pertinent to mention here that the volume of power generated by the plant shall be in the range of 80-85MW, net power to be transferred to the nearest connection point has been considered by the feasibility study consultant at 132kV voltage level. **The nearest 132kV switchyard is at 108MW Golan Gol HPP which is about 5 km from the Project switchyard** and second nearest 132kV grid station is Jutilash which is about 35 km. Keeping in view the difference in length of transmission line ("TL") and associated cost along with other disadvantages, it is recommended by the Feasibility Study Consultant that 132kV TL (D/C) from Project switchyard shall be connected to Golan Gol HPP switchyard or to its outgoing 132kV TL through In/Out connections.

However, the final scheme of power evacuation shall be decided by NTDC after the completion of NTDC's Integrated Power Evacuation Study for Projects located in Chitral. In this regard, the Sponsors of the Project have contacted NTDC requesting them to issue waiver for conducting project specific interconnection study. **NTDC, who *inter alia* is also the POE member of the Project, has issued the waiver on dated 18.03.2019 & 26.03.2019 (copies attached).**

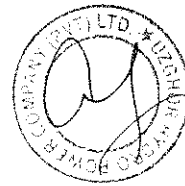
6.11 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

The Environmental and Social Assessment (ESIA) is undertaken as part of the overall feasibility study of Turtonas-Uzghor Hydro Power Project. The ESIA has been accomplished through studies into specific issues such as terrestrial and aquatic ecology, socio-economic and cultural environment, access provisions and resettlement



requirement. The methodology used for the ESIA follows standard international best practices including scoping environmental checklist and comparative matrix. The reporting follows the standards structure of Pakistan regulatory authorities and international funding agency such as IFC.

The Study Area for the ESIA takes into account environmentally sensitive receptors that are most likely to be impacted by the Project's development activities during construction and operation. For assessment of cumulative impacts, the Study Area was selected to be large enough to allow the assessment of the Valued Ecosystem Components ("VEC") that may be affected by the Project activities. **The Company has submitted the ESIA to relevant EPA (EPA Khyber Pakhtunkhwa) on 27th July, 2018 and the study got approved from EPA (KPK) on 24th May, 2019.**



7. PROJECT COST

Turtonas-Uzghor Hydro Power Project (the "Project") is located on Golen Gol Nullah, a left bank tributary of Mastuj River in District Chitral, Khyber Pakhtunkhwa (KPK) Province. The project shall have a gross capacity of 82.25 MW and will generate about 382.30 GWh of energy annually. The project is run-of-river and its associated main facilities are:

- Diversion Weir structure
- Sand Trap
- Headrace tunnels
- Pressure Shaft
- Power House
- Access road & bridges
- Lateral Intake Structure
- Connecting Canals
- Surge Tank
- Pressure Tunnel
- Tailrace
- Residential camps & colony

Following deliberations and discussions at Project Panel of Experts meetings that *inter alia* includes Power Purchaser (CPPA-G Ltd.) as a POE member; the Sponsors are pleased to propose a Project Cost of USD 204.60 Million. The details of the Project Cost are given below:

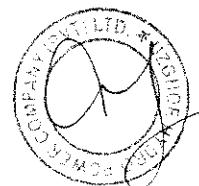
7.1 Project Cost Summary

Summarized Project Cost:

| Section Ref. | Description | Amount (US\$ Mil) |
|---------------------------|--|-------------------|
| 7.2.1 | EPC Cost | 148.93 |
| 7.2.2 | Engineering & Supervision | 5.957 |
| 7.2.3 | Project Development Cost | 14.382 |
| 7.2.4 | Overseas Investment Insurance | 0.148 |
| 7.2.5 | Land Acquisition, Resettlement & Env. Mitigation | 3.283 |
| 7.2.6 | Custom Duties & Taxes | 2.230 |
| 7.2.7 | Insurance During Construction | 2.978 |
| 7.2.8 | Financial Charges | 3.558 |
| 7.2.9 | Interest During Construction | 23.136 |
| TOTAL PROJECT COST | | 204.602 |

Note: The cost estimates used in the Feasibility study were prepared based on price levels prevalent in August 2018. The nominal exchange rate in August 2018 has been taken as 1 USD = PKR123.60.

In line with NEPRA's mechanism for determination of tariff for hydel project, the Project Cost will be firmed up during the EPC stage Tariff.



7.2 Project Cost Details

7.2.1 EPC Cost

The EPC cost would be finally determined at the EPC stage Tariff (2ndStage) Tariff determination after competitive bidding for the EPC contracts is carried out by the Sponsors as per NEPRA's 3-Stage Tariff Mechanism for Hydropower Projects. The current EPC cost in the Feasibility Level Tariff is based on the estimates made in the Feasibility Study of the project.

The Feasibility stage EPC cost estimates are prepared from (a) Bill of Quantities for the preparatory and permanent civil works (b) Costs of E&M equipment (c) Hydraulic Steel Equipment (d) Transportation & Erection Charges (e) Detail Engineering Design. The cost estimates are further subdivided into local and foreign cost components and are benchmarked with similar on-going projects in international and domestic power markets.

The EPC cost is broadly classified into five sub-categories, summarized as under:

Table : Summarized EPC Cost

| DESCRIPTION | USD Million |
|--|---------------|
| CIVIL WORKS & PRILIMINARY WORKS | 79.986 |
| ELECTRICAL & MECHANICAL EQUIPMENT | 40.064 |
| HYDRAULIC STEEL EQUIPMENT | 17.931 |
| TRANSPORTATION & ERECTION CHARGES | 5.220 |
| DETAIL ENGINEERING DESIGN | 5.729 |
| GRAND TOTAL | 148.93 |

The EPC cost will be firmed up at EPC Stage tariff where EPC Contractor for the Project will be selected through International Competitive Bidding ("ICB") Process conducted in a transparent manner and complying with the NEPRA's Guidelines for Selection of EPC Contractor. The ICB process will ensure that the Company receives competitive fixed price EPC offers with further provisions for cost escalations only to the extent as allowed under NEPRA mechanism for Tariff determination for hydel projects.

i. Civil Works including Preparatory Works:

The Civil Works include Infrastructure Works, Diversion and Intake Works, Sedimentation Basin, waterway channels, headrace tunnels, Surge Tank, Pressure tunnel/shaft, Powerhouse, Tailrace, Access road & Bridges, Switchyard, and cost provisioning related to survey & further investigations.

The costs have been sub divided into the following sub-components:

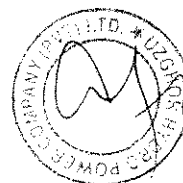


Table : Civil Works (Including Preparatory Works)

| DESCRIPTION | USD Million |
|-----------------------------------|---------------|
| PRILIMINARY WORKS | 7.610 |
| Mobilization and De-Mobilization | 7.238 |
| Temporary and Permanent Residence | 0.372 |
| CIVIL WORKS | 72.376 |
| Weir | 3.257 |
| Fish Ladder | 0.613 |
| Under Sluice | 0.430 |
| Lateral Intake | 1.284 |
| Over Flow Section | 0.173 |
| Sandtrap | 4.355 |
| Headrace Tunnel | 13.644 |
| Surge Tank | 0.916 |
| Pressure Tunnel/Shaft | 9.802 |
| Powerhouse and Tailrace | 10.677 |
| Access Road and Bridges | 27.061 |
| Survey and Investigation | 0.161 |
| TOTAL | 79.986 |

The Civil Works cost estimates have been prepared based on detailed Bill of Quantities and are reflective of the difficult weather & geological conditions and narrow river valley at the Project site and non/limited availability of public infrastructure with regards to accessibility etc.

ii. Electrical & Mechanical Equipment:

The scope of E&M Equipment Supply from a reputable Supplier will mainly include (a) Pelton turbines, generators, generator step-up transformer, governor & oil pressure system and excitation system (2 units of each), (b) spare parts (c) special tools and technical services, (d) balance of plant including Control System, Protection System, Telecommunication System, Crane, Fire Fighting System and Switchgear etc. The technical specification of the equipment will be defined in the Project Requirements of the EPC Contract wherein the requirements for frequency response will be according to the Pakistan Grid Code. The large parts of the generator assembly will be designed and manufactured according to permitted transportation weight and dimension limits. Components exceeding these limits will be designed in a manner to enable assembly of these components on-site.



Table : Electrical & Mechanical Equipment

| DESCRIPTION | USD Million |
|--|---------------|
| ELECTRICAL & MECHANICAL EQUIPMENT | 40.064 |
| TOTAL | 40.064 |

iii. Hydraulic Steel Equipment

The feasibility layout and design for the Turtonas-Uzghor Hydro-electric power Project comprises of the following main components, which include hydraulic steel structure equipment:

- Concrete diversion weir structure with flushing gates of fixed wheel type
- Power intake with coarse trash rack
- Sand trap with gates at inlet and outlet
- Fine trash rack
- Power waterways HSS steel pipes
- Tailrace outlet structure

Table : Hydraulic Steel Equipment

| DESCRIPTION | USD Million |
|----------------------------------|---------------|
| HYDRAULIC STEEL EQUIPMENT | 17.931 |
| TOTAL | 17.931 |

iv. Transportation & Erection Charges

Transportation costs and Erection charges have been assumed to be 9% of the total costs for the E&M and Hydraulic Steel equipment.

Table : Transportation & Erection Charges

| DESCRIPTION | USD Million |
|--|--------------|
| TRANSPORTATION & ERECTION CHARGES | 5.219 |
| Transportation & Erection charges of E&M Equipment's | 3.605 |
| Transportation & Erection charges of Hydraulic Steel Equipment | 1.614 |
| TOTAL | 5.219 |

v. Detail Engineering Design

Detailed design considers an in-depth study of the project area, design of all major and supporting structures. It includes topography mapping, surface and subsurface geological investigation, detailed engineering design of project components and preparation of constructional level drawings such as civil and reinforcement drawings. Furthermore, electro-mechanical and switchyard design are worked out and drawings are prepared. Similarly, construction planning, detailed quantity estimate and financial analysis of project are performed.



Table : Detail Engineering Design

| DESCRIPTION | USD Million |
|--|--------------|
| DETAIL ENGINEERING & SURVEY | 5.728 |
| TOTAL | 5.728 |

7.2.2 Engineering and Supervision

The Project Company has proposed a cost of USD 5.957 Million under this category. The amount is calculated as 4.0% of the EPC cost.

The Engineering and Supervision costs expected to be incurred by the Company comprise costs of the followings:

- Owners Engineer,
- Independent Engineer
- Reopener Verifier under Power Purchase Agreement (PPA).
- Other Engineering Consultants to deal with various technical matters prior to financial close which includes preparation of EPC tendering documents, evaluation of the EPC tenders, assistance during EPC contract negotiations, selection of electro mechanical supplier, review of load flow study, and any other technical matters. These services will continue until appointment of the Owners Engineer. Furthermore, infrastructure projects including hydropower require a strong in-house Technical department as a first and foremost requirement for the monitoring, control and oversight of the project during construction period. Therefore, the Project Company will engage experienced technical staff for "over the shoulder" monitoring of the construction supervision and to manage relationship with Lender's Technical Advisors, PPA Engineer, Power Purchaser and other relevant stakeholders.

Proper Engineering and effective Supervision is the essence for effective and timely execution of the Project. It is pertinent to note that level of effort required by Engineer with regards to design reviews is almost similar in all hydropower projects, however, the construction period of the hydropower has a direct bearing on the cost of such service; the greater the construction period, the longer the Engineers stay at Project site for construction monitoring and oversight.

Further, the quantum of works involved dictates the number of qualified and relevant experts to be stationed at site at any point in time, during the construction phase. The Sponsors/Company requests for approval of US\$ 5.957 million under this cost head for the construction period of 48 months which is very much in line with the tariff determinations of other comparable hydropower projects.

7.2.3 Project Development Cost

Project Development cost is estimated at USD 14.382 Million which is 9.66% of the Project feasibility stage EPC Cost. This cost mainly includes:

- Project feasibility study cost: M/s Fichtner GmbH Germany, a leading International engineering consultant in association with M/s Technical Engineering &



Management Consultants as well as geo-technical firms, prepared the bankable Feasibility Study which covered feasibility stage design including bills of quantity and cost estimation, geological surveys and investigations. The Feasibility Study was duly vetted and approved by the Panel of Experts on 03 June, 2019.

- Cost related to other engineering studies and environmental approvals.
- Cost relating to establishment of the Company and maintaining it in good standing;
- Legal Advisory Charges: (Owner Legal Advisor, Legal Advisor-KPK etc.): Legal fees and charges are associated with engagement of international and domestic law firms for advice on all legal aspects of the Project and Stamp duty and registration fee in respect of project documents. Given long implementation period of the Hydro projects, the services of legal advisors will be required throughout the development and construction period to assist in connection with the negotiation and execution of the project documents.
- Project Advisors: (Tax & Corporate Advisors, Tariff Advisors, Land Acquisition Advisor, Financial Advisor, Insurance Advisers etc.);
- Audit and Regulatory Fees (Regulatory fees to be paid to NEPRA, SECP, and other relevant authorities) in the normal course of business and for various consents to be obtained and maintained during construction phase;
- Costs related to the performance guarantee and non-refundable processing fees to be furnished to PPIB at the time of issuance of LOS, financial close & COD;
- Costs related to the Power Purchaser letter of credit to be furnished to the Power Purchaser pursuant to the provisions of the PPA;
- Costs relating to various permits for the Project;
- Cost of Chinese experts and expats seconded by sponsors for the Project development;
- Management cost as well as Company salaries and wages, utilities, travelling and conveyance, security, office supplies cost, rent rates and taxes, medical and travel insurance, fees and subscription, vehicles running and maintenance, repair and maintenance, printing stationary and periodical, miscellaneous and other expenses.

Sound project development is key to the success of any project, and is absolutely critical for such project as the development activities and has already taken several man months of time and efforts of various professionals and staff. Due to projects' complexity this will continue all the way to financial close (five years from issuance of LOI), then Project COD (four years after FC) and throughout the term of the PPA. Company needs to ensure it is able to hire and retain both Pakistani as well as Chinese top professionals and has a ready talent pipeline to manage this infrastructure project.



Furthermore, Project Development Cost of US\$14.382 million represents 9.66% of the EPC Cost and is fully comparable with the precedents of hydropower IPPs in Pakistan as approved by NEPRA and shown below:

| Project | Capacity | Development Cost ("DC") | |
|---------------------|----------|-------------------------|----------------------|
| Arkari Gol, Chitral | 99 MW | Management Cost | 19.48 Mil.USD |
| | | Feasibility Cost | 2.04 Mil.USD |
| | | Total Dev. Cost | 21.52 Mil.USD |
| | | Total EPC Cost | 150 Mil.USD |
| | | DC (% of EPC) | 14.34% |
| Mahl Hydro, AJK | 540 MW | Development Cost | 39.06 Mil.USD |
| | | Law Services | 3.7 Mil.USD |
| | | Total Dev. Cost | 42.76 Mil.USD |
| | | Total EPC Cost | 718.77 Mil.USD |
| | | DC (% of EPC) | 5.95% |

7.2.4 Overseas Investment Insurance

According to the requirement of the Chinese government, state-owned enterprises such as Sinohydro, undertaking overseas investments are required to acquire overseas investment insurance from Sinosure; therefore, it is essential that the Equity investment is secured for political risks by Sinosure.

Overseas Investment Policy is intended to provide the insured with risk guarantee when they suffer economic losses because of war, currency exchange ban, requisition, or breach of contract by the government or related counterparts in countries where the insured have made investments. The fee charged shall apply during construction as well as operations period of the Project, in accordance with the following terms:

| Policy | Overseas Investment Insurance |
|--|-------------------------------|
| Total Equity (Mil.USD) | 40.92 |
| Minimum Equity Participation by Sinohydro* | 20% |
| Equity Participation (Sinohydro) (Mil. USD)* | 8.184 |
| Premium Rate | 0.70% |
| Total Premium (US \$ in Millions) - Construction | 0.148 |
| Total Premium (PKR/KW/M) - Operations | 6.459 |

*The actual quantum of Sinohydro equity investment is not finalized at this stage. Actual Equity Participation / Shareholding Structure between the Sponsors / any new Sponsor(s) shall be finalized at the EPC Stage. The Overseas Investment Insurance shall be adjusted at EPC stage as per actual overseas investment by the project foreign partners.

Authority is requested to allow Sinosure on equity, as the same is mandatory for Chinese investment in Pakistan.

Sinosure on foreign debt is not included in Reference Tariff calculations. If required by the Sponsors, the Authority is requested to allow the adjustment in the Reference Tariff at the time of EPC Stage.



7.2.5 Land Acquisition, Resettlement & Environment Protection

The cost for Land Acquisition, resettlement and Environment protection is estimated at USD 3.28 Million based on standards prevailing in Golen Gol area through the investigation by the Feasibility Consultant. This cost will be utilized for acquisition of land, compensation for resettlement to the inhabitants of the area to be affected by the development of the Project, compensation for removal of trees and crops and other allied costs, to be incurred by the Project Company. The Company is cognizant with its environmental obligations under Pakistan and relevant Provincial laws as well as environment and safeguard policies of IFC and other multilateral banks.

The summary of the costs accumulated under this category is provided below for reference. The detail breakup and explanation regarding these costs is available in Turtonas Uzghor HPP Feasibility Report.

Table 8: Land and resettlement cost

| No. | Description | PKR Million | USD |
|-----|--|----------------------|--------------------|
| 1 | Land Acquisition | 272,756,030/- | 2,206,764/- |
| 2 | Environment Management & Monitoring Cost | 133,070,602/- | 1,076,623/- |
| | Total | 405,826,632/- | 3,283,387/- |

In accordance with the NEPRA mechanism for determination of tariff for hydropower projects land acquisition cost will be adjusted based on the actual verifiable documentary evidence at the time of Project COD. In addition, the Authority is requested to allow adjustment pertaining to additional Environment & Social Costs (if required) based on the requirements of Lenders imposed after start of project construction at COD stage tariff of the Project.

7.2.6 Custom Duties, Taxes & Other Levies

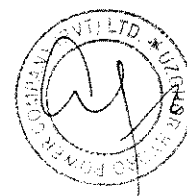
Customs Duty and taxes have been calculated at USD 2.230 Million by the Project Company in accordance with the Power Generation Policy, 2015:

- Custom Duty @ 5.00% (Five Percent) has been assumed on the hydro electrical and mechanical equipment and machinery, and materials for the Project, in accordance with the Policy. No other taxes or duties, including but not limited to, sales tax, excise duty or road tax have been assumed to be applicable. The cost will be adjusted as per actual at COD.

7.2.7 Insurance during Construction:

Insurance during construction is estimated at USD 2.978 Million which is 2% of the EPC cost. Insurance during Construction cost covers the insurance cost of the Project's assets during the construction period. As per the requirement of the PPA, Company is required to maintain following insurances:

- Construction All Risk Insurances (CAR);
- CAR Delay in Start-up Insurance;
- Terrorism Insurance;
- Marine and Inland Transit Insurance;



- Marine - Delay-In-Start-up Insurance; and
- Comprehensive General Liability.

At the EPC stage formal quotations will be obtained from the insurance brokers and cost will be claimed based on the quotations.

7.2.8 Financial Charges:

The Financial charges of USD 3.558 Million are calculated at 2.5% of the total loan amount (excluding Financial Charges and IDC). Financial fee and charges include the costs related to the debt financing of the Project. Such costs include the fee related to arrangement of debt, legal fees, advisory charges, lenders' mandate fee, up-front fee, commitment fee and charges related to various letters of credit to be established in favour of various contracting parties; fees payable and stamp duty applicable on the financing documents; agency fee; security trustee fee, commitment fee, mandate fee, Lenders Project monitoring fee and charges as may be required by the Lenders. The financial charges computed are based on feasibility stage project cost and debt requirements. Any change in overall project cost will result change in financial charges thus the above costs will remain subject to revisions at the later stages. The cost will be adjusted in accordance with the executed financing documents and thereafter in accordance with actual drawdown during construction.

7.2.9 Interest during Construction (IDC):

The Interest during Construction (IDC) has been calculated at USD 23.136 Million based on the following assumptions:

| | | |
|---------------------------|---|-----------------------|
| ▪ LIBOR | : | 2.31% (Aug. 20, 2018) |
| ▪ SPREAD | : | 4.60% |
| ▪ Interest Rate (Foreign) | : | 6.91% |
| ▪ KIBOR | : | 7.93% (Aug. 20, 2018) |
| ▪ SPREAD | : | 2.75% |
| ▪ Interest Rate (Local) | : | 10.68% |

The assumption for spread over LIBOR/KIBOR is based on Authority (Benchmarks for Tariff Determination) Guidelines, 2018 and is a true reflection of lenders concerns with regards to hydropower project's location, general geo-political environment, longer construction period and carrying of significantly higher construction risk.

Actual IDC, however, shall be subject to change depending on the fluctuations in base rate (3-month LIBOR/KIBOR), funding requirement (draw-downs) of the Project during the construction period, changes in Project Cost including changes due to Re-Openers as well as variation in PKR / USD exchange rate. The IDC calculations are based on 4 years construction period.



8. FINANCING PLAN

The Project shall be financed at debt to equity ratio of 80:20 as per the assumptions of the feasibility study. The total Project Cost stands at USD 204.602 Million, which requires Debt injection of USD 163.68 Million and Equity amounting to USD 40.92Million.

8.1 Debt Financing:

The financing plan is based on the assumption that the Project will be financed through combination of local and foreign loan; however, financing plan will be finalized at a later stage. The risk profile of the Project is higher from lender's perspective due to following reasons:

- Lower Credit rating by international rating agencies.
- long construction period

The lending terms assumed in the Feasibility Study are as follows:

Table 8.1: Lending terms for financing plan:

| Loan Currency | USD |
|----------------------------|------------------------|
| Financing | 90% Foreign; 10% Local |
| Foreign Debt Amount | 147.31 Million |
| Local Debt Amount | 16.36 Million |
| Construction Period | 4 Years |
| Repayment Period | 12 Years from COD |
| LIBOR | 2.31% |
| Spread | 4.60% |
| KIBOR | 7.93% |
| Spread | 2.75% |
| Repayment | Quarterly |

Note: Loans (if) arranged from Chinese banks will be covered under the Sinosure insurance.

LIBOR / KIBOR rates (3 month tenor) of 20.08.2018 are assumed in the financing plan.

8.2 Equity Funding:

The Equity funding will be 20% of the Project cost as provided in the Feasibility stage tariff which amounts to USD 40.92 Million. In accordance with LOI issued to the Sponsors by PPIB under Power Generation Policy 2015, the Main Sponsor (Sinohydro) along with other Sponsor (Sachal) shall jointly hold at least 51% of Project shareholding during the "lock-in-period" which will be from the issuance date of the Letter of Support (LOS) until the sixth anniversary of the successful commissioning of the "Project". Furthermore, the Main Sponsor (Sinohydro) shall participate and hold not less than twenty percent (20%) of the equity during the Lock in Period.

Therefore, Sinohydro (or its direct subsidiary) and Sachal will jointly participate and hold 51% of the equity during the "lock-in-period" which will be from the issuance date of the Letter of Support (LOS) until the sixth anniversary of the successful commissioning of the Project.



Other equity holder will be organized by the Applicant from other potential investor(s) to take maximum forty nine percent (49%) of the equity/project shareholding. In case, the potential investor(s) could not be found to take the remaining equity 49% of total equity; Sinohydro and Sachal will discuss and jointly contribute the remaining equity.

8.3 ROE, ROEDC & Equity Redemption:

As in the case of various hydropower projects being implemented in Pakistan, the Return on Equity ("ROE") and Return on Equity during Construction ("ROEDC") have been computed at 17% (IRR based). Considering the BOOT nature of the Project, Equity Redemption has also been included in the tariff after repayment of the debt as per NEPRA's Mechanism for Development of Tariff for Hydropower Projects.

Return on Equity is a means of compensating the Sponsors for investing equity capital into a Project. It is based on two factors. (i) the cost of capital, and (ii) the perception of risks associated with the Project. Where the project is structured in a manner that passes most of risks outside the control of the Sponsor to the Power Purchaser or the GOP, and where the legal, regulatory and institutional environment ensures the contractual rights of project financiers, the sponsor can accept lower equity returns, even as low as 15%. In contrast, a hydropower project is high-risk given (a) the long (at least 4 years development period + 4 year construction period) gestation; (b) the large amount of financing required for completion together with the fact that the civil works amount to over 50% of project costs; (c) high degree of engineering involved; (d) uncertainty of construction floods (high dependency on weather conditions); (e) possibility of unforeseen eventualities.

In summary, the risks associated with development of hydropower projects are higher than those associated with other types of renewable energy projects due to the following reasons:

- I. Longer construction period - wind/solar power projects require construction period ranging between 12-18 months whereas a typical hydropower project requires a construction period of around 48 months;
- II. Wind projects can be implemented using modular approach (like adding 10MW every year) this helps to reduce the project risk profile this approach cannot be adopted for development of hydropower projects;
- III. Project size - as noted above, the size of a hydropower project such as this increases the associated risks;
- IV. The economic return to the Pakistan economy is much higher by the construction of a hydropower project as compared to the corresponding economic return associated with wind/solar power projects, as a hydropower project comparatively uses local materials and labor far more extensively. Accordingly, a higher return is required in order to motivate and encourage investments in hydropower projects.

Moreover, the Security situation in Pakistan has been relatively unpredictable and still a major concern for foreign investors. In particular, foreign contractors and consultants



have had travel advisories and restrictions prohibiting or limiting travel to Pakistan, thereby causing significant delays in project implementation. In order to compensate for increased political risk and security issues, coupled with ongoing economic uncertainties (e.g. circular debt), the required rate of return of 17% IRR is fully justified and hereby requested for approval by the Authority.



A large, handwritten signature in black ink, appearing to be "A. J. Khan".

9. TARIFF AND DEBT SCHEDULE

The proposed Reference Tariff is a divided in to two-part as per standard structure of tariff and the Policy for Power Generation 2015:

- Energy Purchase Price (EPP) for the energy generated and delivered to the Power Purchaser. EPP includes Variable O&M Component (Foreign & Local) and Water use charge; and
- Capacity Purchase Price (CPP) based on the installed capacity, includes Fixed O&M (Foreign & Local), Insurance, Return on Equity, Return of Equity during Construction, Debt Service Components.

The proposed Feasibility Stage Tariff is prepared based on the cost estimates provided in the feasibility study which will be firmed up at later stages of tariff determinations in accordance with the Mechanism for Tariff Determination by NEPRA for Hydropower Projects and the Assumptions stated herein. A component wise commentary on the Reference Tariff Table follows:

9.1 Operations Costs:

The operational cost of the Project comprises of the operations and maintenance cost, water use charge and the cost of the operational period insurances. A brief summary of the operational cost assumed at this stage is as under:

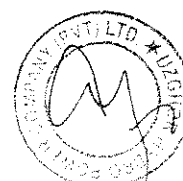
Table 9.1: Operations Cost

| Cost | USD Million p.a. |
|-------------------------------|------------------|
| O&M Cost | 3.067 |
| WATER USE CHARGE | 1.301 |
| INSURANCE COST | 1.489 |
| OVERSEAS INVESTMENT INSURANCE | 0.057 |
| TOTAL OPERATIONS COST | 5.91 |

9.1.1 Plant O&M

For Operations and Maintenance of the Complex, the Project Company is proposing an annual figure of USD3.067 Million per Annum which is 1.50% of Project Cost. The O&M Cost includes personnel cost, administrative / Management expenses, maintenance cost, replacement of parts necessitated due to regular operation / normal maintenance and other costs. After the COD, plant's operation & maintenance activities will be carried out by the Project Company itself, or, by an experienced and proficient O&M operator. In either case, the O&M team will maintain and efficiently operate the plant in accordance with international standards and practices including accepted norms of health, safety and the environment practices.

When presented as a percentage of Project Cost, the O&M cost for the Project comes out as 1.50% of Project Cost, which is in line with O&M allowance for various other hydropower projects. The O&M cost will be incurred in local as well as foreign currency - percentage of local: foreign is based on recent determination by NEPRA in case of



other hydro projects. In the EPC stage, this percentage will be finalized based on the expenses breakup.

The indexation on these components will be as per the following table:

Table 9.2: O&M Subcomponents

| SUB-COMPONENT | Fixed O&M | Variable O&M | Indexation |
|---------------|-----------|--------------|--|
| Local | 35% | 65% | Pakistan CPI (General) |
| Foreign | 65% | 35% | US CPI (All Urban Consumers) PKR / USD Indexation |

The ratio of Fixed and Variable O&M is 80:20. For Variable O&M, the breakup between foreign and local sub components is 35% and 65% respectively, while in the case of Fixed O&M, the breakup between foreign and local sub components is 65% and 35% respectively.

The O&M Cost includes the fixed fee payable to the O&M operator for carrying out the regular operations and maintenance services of the Project of which 35% is usually borne in local currency and the remaining 65% is paid in foreign currency. This includes the costs associated with routine and preventive maintenance services to be performed by the O&M operator as well as the administrative costs associated with provision of the O&M services.

9.1.2 Water Use Charges

The amount payable is based on actual energy dispatched to the grid. As per the GOP Power policy 2015 Water Use Charge was fixed at PKR 0.425 / kWh with adjustment from time to time. As per decision there will be no indexation, however rates will be revised from time to time; so it is requested to allow any change in Water Use Charge as a pass through.

9.1.3 Insurance Cost

The Insurance during operations period is in line with the NEPRA's established benchmark of 1% of EPC Cost which translates to USD 1.489 Million per Annum. The insurance cost consists of operations all risk insurance for the project, as well as business-interruption insurance, terrorism insurance and third party liability insurance which are standard insurances required by all lenders' and also set out under the PPA. These insurances are required to be maintained throughout the life of the Project.

9.1.4 Overseas Investment Insurance

Sinosure premium is estimated at USD 1.17 Million based on following assumptions:

- Sinosure Policy : Overseas Investment Insurance
- Premium Rate : 0.70%

The According to the requirement of the Chinese government, state-owned enterprises such as Sinohydro, undertaking overseas investments are required to acquire overseas



investment insurance from Sinasure. The above estimate is assumed on the basis of minimum equity contribution by Sinohydro (20% of total equity).

9.2 Return on Equity & Return on Equity during Construction

The ROE component has been computed at 17% IRR based return on the invested equity as per the current rate allowed by the NEPRA to the hydropower IPP projects under three stage tariff mechanisms. However it is requested if a higher return is allowed to any hydropower project in future the same shall be allowed to the Project Company without any discrimination.

9.3 Debt Financing

The debt servicing component is worked out based on the following assumptions:

Table 9.3: Financing Assumptions:

| Loan Currency | USD |
|----------------------------|------------------------|
| Financing | 90% Foreign; 10% Local |
| Foreign Debt Amount | 147.313 Million |
| Local Debt Amount | 16.368 Million |
| Construction Period | 4 Years |
| Repayment Period | 12 Years from COD |
| LIBOR | 2.31% |
| Spread | 4.60% |
| KIBOR | 7.93% |
| Spread | 2.75% |
| Repayment | Quarterly |

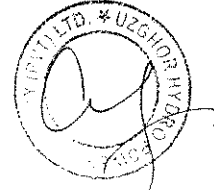
The Debt servicing component is based on financing structure and the interest rates as explained above. This will be adjusted based on the actual debt drawn and variation in LIBOR/KIBOR.

9.4 Reference Drawdown Schedule

| Year | Period [(Quarterly)] | Percentage |
|------|----------------------|------------|
| 1 | 1 | 7.0% |
| | 2 | 7.0% |
| | 3 | 7.0% |
| | 4 | 7.0% |
| 2 | 5 | 7.75% |
| | 6 | 7.75% |
| | 7 | 7.75% |
| | 8 | 7.75% |
| 3 | 9 | 7.25% |
| | 10 | 7.25% |



| | | |
|---|----|-------|
| | 11 | 7.25% |
| | 12 | 7.25% |
| 4 | 13 | 3.00% |
| | 14 | 3.00% |
| | 15 | 3.00% |
| | 16 | 3.00% |



10. INDEXATIONS, ESCALATIONS & COST ADJUSTMENTS

10.1 Adjustments due to variation in Project Cost Components

The proposed Feasibility Stage Reference Tariff for the Project has been computed based on the costs and the basis / assumptions as discussed in this petition. The project cost and the Reference Tariff as determined pursuant to this petition shall be subject to adjustment for the following Cost Reopeners:

- a. Withholding Tax on the EPC Contract
- b. Sales Tax on EPC Contract
- c. Civil Cost Escalation
- d. Cost variation due to change in Rock classification
- e. Variation in Cost of Land Acquisition and Resettlement
- f. Change in Project Cost due to variation in USD / PKR parity
- g. Change in Project Cost based on Actual Interest during construction
- h. Variation in Duties & Taxes
- i. Change in Principal Repayment and cost of Debt based on Drawdowns
- j. Insurance Cost
- k. Change in Reference Return on Equity and Reference ROEDC
- l. Financial Charges
- m. Insurance during Operations
- n. Overseas Investment Insurance based on actuals
- o. Withholding Tax on Overseas Investment Insurance
- p. Reference Tariff Table

The mechanism for cost adjustments on account of the above factors is discussed in the following paragraphs.

a. Adjustment for Withholding Tax on EPC Contract

Withholding tax at 7% is assumed at Project's Onshore Cost Component and has been catered for under the Project Cost. No withholding tax is anticipated on the Project's Offshore Cost Component. In case there is any change in the above assumptions as well as any change in rate of withholding tax, than the same shall be allowed by the Authority and the Reference Tariff will need to be adjusted accordingly.

b. Adjustment for Sales Tax on EPC Contract

After the promulgation of 18th Constitutional Amendment which provided fiscal autonomy to Provinces, Engineering and Construction (E&C) services are now subject to Sales Tax as per the Provincial Sales Tax laws. Sales tax on construction services is not included in the feasibility level EPC Cost. Therefore, it is requested that the same shall be allowed by the Authority as part of the Project Cost, at EPC tariff stage based on the rates prevalent at that time.

c. Adjustment for Civil Cost Escalation

The Reference EPC Cost shall be adjusted for any changes in the cost of labor, steel, fuel, cement and electricity by the addition or deduction of the amounts determined



by the formula prescribed hereunder to determine the EPC Cost on COD. The adjustment formula for adjustment in the Reference EPC Cost for any changes in the cost of labor, steel, fuel, cement and electricity shall be applied throughout the Construction Period as follows: Each Milestone amount as will be agreed in EPC Contract shall be multiplied by the following adjustment multiplier: The formula with the adjustment weightings incorporated into the EPC contract as under:

$$P_n = a + b (C_n/C_o) + c(S_n/S_o) + d(F_n/F_o) + e(L_n/L_o)$$

Where:

- "P_n" is the adjustment factor to be applied to the estimated value of the work carried out in month "n"
- "a" is a fixed coefficient representing the non-adjustable portion of the Onshore Contract price
- "b", "c", "d", and "e" are coefficients representing the estimated proportion of each cost element - labor, fuel, cement, and reinforcing steel, respectively, in the works
- "L_o", "F_o", "C_o", and "S_o" are the base cost indices or reference prices corresponding to the above cost elements
- "L_n", "F_n", "C_n", and "S_n" are the cost indices or prices corresponding to the above cost elements in month "n"

d. Adjustment for Cost variation due to change in Rock classification

Cost Variation due to geological conditions related to all underground works i.e. tunneling will be sought, in accordance with the concepts elaborated in the NEPRA Tariff Mechanism for Hydropower Project which explicitly aims to mitigate for the uncertainties in underground "tunneling". The company will submit necessary details supported by the reports issued by the Reopener verifier and any document required in this respect to NEPRA after COD for adjustment in Project cost and the Reference Tariff for Cost reopeners.

e. Adjustment for variation in Cost of Land Acquisition and Resettlement

An amount of **USD2.20Million** for Land Acquisition and Re-settlement is included in the project cost estimates to cater for the Land acquisition and resettlement. However as per the NEPRA mechanism for determination of tariff for hydropower projects this cost will be adjusted based on the actual verifiable documentary evidence at the COD.

f. Adjustment in project cost due to variation in USD / PKR parity

Any variation in the project cost during construction period on account of variation in USD / PKR parity shall be allowed through adjustment in project cost based on production of verifiable documentary evidence to the satisfaction of NEPRA.

g. Adjustment in project cost based on actual Interest during Construction

Interest during construction has been estimated at **USD23.136 Million** based on the estimated debt injections schedule. This will be adjusted at the COD as per the actual



debt injections pattern, variation in PKR/USD, debt drawn and applicable KIBOR & LIBOR during the construction period allowed by NEPRA.

h. Adjustment for variation in Duties & Taxes

Duties and taxes are estimated at **USD2.23 million**. The duties and taxes paid on the imported plant & machinery and other applicable taxes, GOP levies, provincial levies and other charges imposed on the Company, which are non-refundable in nature, will be adjusted on actual basis on production of verifiable documentary evidence by the Company to the satisfaction of NEPRA.

i. Adjustment in Principal Repayment and Cost of Debt

The Reference Principal Repayment Component and the cost of debt will be adjusted at the COD as per the actual debt composition between Local & Foreign and variation in KIBOR & LIBOR at the COD.

j. Adjustment of Insurance Cost

Insurance during Construction will be adjusted at the COD based on actual subject to the maximum of 2% of the adjusted and approved EPC cost upon production of verifiable documentary evidence to the satisfaction of NEPRA.

k. Adjustment in Reference Return on Equity and Reference Return on Equity during Construction

Reference Return on Equity and Reference Return on Equity during Construction will be adjusted at COD on the basis of Actual equity injections and PKR/USD variation (within the overall equity allowed by the NEPRA at the COD) during the construction period allowed by NEPRA. Similarly, as per NEPRA's Mechanism for Development of Tariff for Hydropower Projects, special Return on Equity ("SROE") on the amount of equity invested during 30 months prior to financial close has not been included in ROEDC and the Authority is requested to allow the necessary adjustment of reference tariff at the Project EPC stage.

l. Adjustment for Financial Charges

Financial charges will be adjusted at the COD on the basis of actual subject to the maximum of 2.5% of the total debt allowed (Excluding impact of interest during construction and Financial Charges) upon production of verifiable documentary evidence to the satisfaction of NEPRA.

m. Adjustment of Insurance during Operations

Insurance cost for the operational period will be adjusted on the basis of actual subject to maximum of 1% of the EPC costs at COD on production of verifiable documentary evidence by the Company.

n. Adjustment of Overseas Investment Insurance

Overseas Investment Insurance on Equity has been calculated using assumptions of Overseas Investment Insurance policy at 0.70% per annum on 20% of total equity requirement of the project. In case of any change in assumptions NEPRA will allow based on actual documentary evidence provided by the Company and will be



adjusted on the Commercial Operations Date. Further, applicable Overseas Investment Insurance fee during the construction period will be adjusted at the COD as per the actual equity injection pattern and variation in PKR/USD subject to maximum of 0.70% per annum (excluding withholding tax) and payment terms as approved by NEPRA based on documentary evidence provided by the Company. In case of Project Company arranged project debt financing through Chinese banks, NEPRA will allow Sinosure on debt based on actual documentary evidence provided by the Company at the EPC stage and will be adjusted at COD.

o. Adjustment for Withholding Tax on Overseas Investment Insurance

If the Company is required to make payment of withholding tax on Overseas Investment Insurance during the construction period and operations period, the same shall be allowed as pass through item based on production of verifiable documentary evidence to be provided by the Company.

p. Adjustment for additional Environmental & Social Costs

If the Company is required to make payments for additional Environment & Social Costs based on the requirements of Lenders imposed after start of project construction, the same shall be allowed to be adjusted at COD on production of verifiable documentary evidence to be provided by the Company.

q. Adjustment of Reference Tariff Table

The Reference Tariff Table shall be revised at COD which taking into account the above adjustments.

10.2 Indexations & Escalation of Tariff Components

It is submitted that indexations be made on 1st January, 1st April, 1st July and 1st October respectively, on the basis of latest information available with respect to Consumer Price Index (CPI) (General), as notified by PBS, US CPI (for all Urban-consumer) as notified by US Bureau of Labor Statistics and exchange rate as notified by NBP. Following indexations have been assumed as part of the application:

Table 10.1: Indexations

| Tariff Components | Indexations |
|-------------------------------|---|
| Water Use Charge | As revised from time to time by GOP |
| Variable O&M | Local : CPI General Foreign : PKR/USD & US CPI General |
| Fixed O&M | Local : CPI General Foreign : PKR/USD & US CPI General |
| Insurance | Adjusted as per actual |
| Return on Equity | PKR / USD variation |
| ROEDC | PKR / USD variation |
| Overseas Investment Insurance | PKR / USD variation |
| Debt Service (Principal) | PKR / USD variation |
| Debt Service (Interest) | LIBOR / KIBOR & PKR / USD variation |



11. PASS THROUGH ITEMS

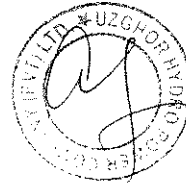
Pass-through items shall be payable by the Power Purchaser to the Company on the basis of the actual costs reasonably incurred by the Company to satisfy the requirements of the Power Purchase Agreement & applicable laws of Pakistan. The following items shall be Pass-Through items:

- a. The payments to Workers Welfare Fund and Workers Profit Participation Fund have not been accounted for in the Project budget and have been assumed to be reimbursed as pass through at actual by the Power Purchaser.
- b. Zakat deduction on dividends as required under Zakat Ordinance is considered as a pass through;
- c. No tax on income of proposed company (including proceeds against sale of electricity to Power Purchaser has been assumed. Corporate tax, Minimum Tax, Alternative Corporate Tax, turn over tax, general sales tax / provincial sales tax and all other taxes, excise duty, levies, fees etc. by any federal / provincial entity including local bodies as and when imposed, shall be treated as a pass through item;
- d. No Provincial taxes such as Education Cess etc. have been assumed in the tariff petition. In case Project is required to pay any such taxes, same shall be treated as a pass through item;
- e. No hedging cost is assumed for exchange rate fluctuations during construction and all cost overruns resulting from variations in the exchange rate during construction shall be allowed as pass through;
- f. Any costs incurred by Project Company, which are required to be incurred by Power Purchaser pursuant to provisions of PPA shall also be treated as pass through.
- g. Withholding tax at 7% is assumed at Project's Onshore Cost Component and has been catered for under the Project Cost. No withholding tax is anticipated on the Project's Offshore Cost Component. It is assumed that no part of plant and equipment supplied by the foreign manufacturer will be treated as locally manufactured. In case there is any change in taxes etc., or additional taxes, fees, excise duty, levies, etc. are imposed, the EPC cost and ultimately the Project cost and the Reference Tariff will need to be adjusted accordingly;
- h. Any other taxes and charges whether during construction and operation periods including but not limited to Sales Tax on EPC Contract, Withholding tax on EPC Offshore Contract incurred by the Project Company shall be treated as pass through.
- i. If the Project Company is required to make payment of withholding tax on debt servicing the same shall be treated as Pass-through item. The Power Purchaser shall reimburse to the Company the actual amount paid on account of withholding tax.
- j. The reference tariff and project cost is based on assumption of withholding tax on dividends at the rate of 7.5% of dividends paid by Company and this rate is not considered as pass through. However, in case of any increment by government in



the rate of withholding tax on dividends above 7.5%, the same shall be treated as pass through.

- k. If the Project Company is required to make payment on account of Water Utilization Cess to IRSA, the same shall be treated as Pass through cost to the Project Company and shall be reimbursed by the Power Purchaser on the basis of actual payment made by the Project Company after verification of documentary evidence.
- l. Cost incurred or suffered by the Project Company for any change in general Assumptions as provided in Section 12 below.



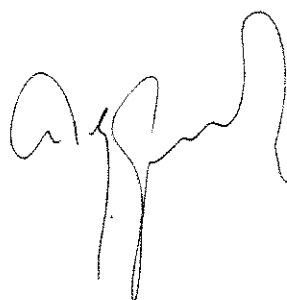
12. GENERAL ASSUMPTIONS

The proposed Reference Tariff is based on the following assumptions. A change in any of these assumptions will necessitate a corresponding adjustment in the Reference Tariff:

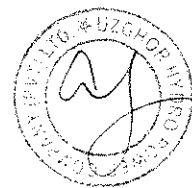
- a. Considering the three stage tariff determination process as applicable in Pakistan, the tariff is based on the project cost derived from individual costs and quantities as assumed in the feasibility study and will remain subject to adjustments, after detailed engineering design and then agreement of a firm EPC cost, during the second and third stage tariff determinations. Typical tariff re-openers as are available under the applicable tariff determination mechanism will be available to the Project at later stages of tariff determination.
- b. Currently the Project Company has assumed that the Debt for the Project will be sourced through foreign and local financial institutions. Exact composition of debt i.e. local: foreign will be finalized prior to financial close; adjustment against the same will be requested at the time of COD stage tariff.
- c. An exchange rate of PKR 123.6/USD (as of 20th August, 2018) has been assumed. Indexation against PKR/USD variations from and after the aforesaid date will be permitted for debt servicing payments and all other project costs denominated in foreign currency. Tariff components shall be respectively indexed for exchange rate variations.
- d. The timing of drawdown of debt and equity may vary from those specified in this Petition; as such, the Project Cost and IDC will be adjusted on the basis of actual drawdowns at COD. Similarly, ROEDC component will also be updated in the Reference Tariff at the COD;
- e. As per NEPRA's Mechanism for Development of Tariff for Hydropower Projects, Special Return on Equity on the amount of equity invested during 30 months prior to financial close has not been included in ROEDC; adjustment against the same will be requested at the time of EPC stage tariff.
- f. Adjustments in Project Cost due to variation in PKR / USD variations and KIBOR / LIBOR fluctuations will also be catered for at the time of COD;
- g. Taxes and Duties amounting to USD2.23 Million have been assumed on the import of plant and equipment under Power Generation Policy 2015 will be adjusted as per actual payment at COD;
- h. Withholding tax on offshore supplies, sales tax & provincial sales tax on the works and services is not assumed at this stage. In case there is any change in any taxes or duties above, or additional taxes, fees, excise duty, levies etc. are imposed, the same shall be treated as part of EPC/Project cost and the Reference Tariff will be adjusted accordingly. Furthermore no provincial taxes have been assumed in the tariff petition. In case Project is required to pay any such taxes commensurate adjustment will be requested at the time of EPC stage tariff or the COD stage tariff (as the case may be).
- i. The Power Purchaser will compensate for energy delivered to the power purchaser prior to COD. For this purpose Energy Purchase Price shall be paid for all energy delivered prior to COD. Payments will be invoiced to the Power Purchaser as per mechanism specified in the PPA;



- j. The Power Purchaser shall be solely responsible for the financing, engineering, procurement, construction, testing and commissioning of the interconnection and transmission facilities. Furthermore, the Power Purchaser will be solely responsible for operation and maintenance of the interconnection and transmission facilities;
- k. Hydrological risk will be borne by the Power Purchaser;
- l. The Power Purchase Agreement will be structured as a take-or-pay contract whereby the Capacity Purchase Price will be payable to the Project Company regardless of actual dispatch levels;
- m. Water Use Charge and its revisions will be in accordance with Power Generation Policy, 2015 as amended from time to time;
- n. Project contingency and maintenance reserves are not included in Reference Tariff calculations. If required by lenders, these will be adjusted accordingly in the Reference Tariff;
- o. Sinosure on foreign debt is not included in Reference Tariff calculations. If required by Sponsors, it will be adjusted accordingly in the Reference Tariff at the time of EPC Stage;
- p. CDM revenues, if any, will be dealt with in accordance with Government Policy;
- q. O&M mobilization fee is not included in Reference Tariff calculations. The same will be adjusted accordingly in the Reference Tariff at the time of EPC Stage;
- r. No provision for working capital and debt service reserve account has been made in Reference Tariff calculations. If required, the same shall be adjusted in the Reference Tariff at EPC Stage or COD Stage (as the case may be);
- s. In case of any unintentional error or omissions, typographic errors, and any genuine assumption being overlooked, the same will be corrected/incorporated and advised to CPPA/NEPRA as soon as the Sponsors/Project Company becomes aware of it;
- t. Any additional costs incurred to cater for any modifications or additions required by the PESCO, NPCC, NTDC or Power Purchaser will form part of the Project cost at EPC Stage or COD Stage (as the case may be);
- u. The cost of Community Investment Plan (CIP) or activities pertaining to Corporate Social Responsibility (CSR) is not assumed / made part of the Project Cost. If required, the same shall be adjusted in the Reference Tariff at EPC Stage or COD Stage (as the case may be);
- v. Any additional indexation or concession allowed by the GOP, Provincial Government or NEPRA or any other Govt. entity to any IPP will be allowed to Sponsors/Proposed Company without any discrimination.
- w. The EPC Cost alongside various other components of Project Cost are currently based on feasibility stage cost estimates and will be firmed up in later stages based on NEPRA Mechanism for determination of tariff for hydropower projects and NEPRA Guidelines for selection of EPC Contractors.

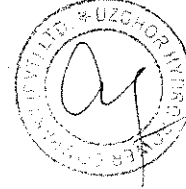


13. ANNEXURES



The Tariff Petition (including the following Annexures) is submitted in triplicate together with:

1. Proposed 30 Year Tariff (Annexure 1)
2. Debt Repayment Schedule (Annexure 2)
3. Board Resolution of Uzghor Hydro Power Company (Pvt.) Limited; dated 14th January, 2020 (Annexure 3)
4. Affidavit of Mr. Abdul Karim Qureshi; dated 16th January, 2020 (Annexure 4)
5. Copies of Bank Draft (Annexure 5)
6. Copy of Letter of Intent (LOI) issued by PPIB (Annexure 6)
7. Copy of Feasibility Study approval by Panel of Experts & PPIB (Annexure 7)
8. Copy of NTDC waiver to Sponsors from conducting Project Specific Interconnection Study (Annexure 8)
9. Copy of CPPA and PESCO letters regarding Interconnection Study (Annexure 9)
10. Copy of Company Incorporation Certificate (Annexure 10)
11. Copy of Memorandum & Article of Association of the Company (Annexure 11)



ANNEXURE - 1:
PROPOSED 30 YEAR TARIFF



Annexure-I: Reference Tariff Table

Turtonas Uzghor Hydropower Project

REFERENCE TARIFF TABLE

| Year | Energy Purchase Price | | | | | Capacity Purchase Price | | | | | | | | | | Total Tariff |
|--|-----------------------|------------------------|--------------|---------------------|-------------------|-------------------------|-----------|-----------|----------|-------------------------------|---------------------|-----------|------------|-----------------------------|---------|--------------|
| | Variable O & M Local | Variable O & M Foreign | Water Charge | Total Energy Charge | Fixed O & M Local | Fixed O & M Foreign | Insurance | ROE | ROEDC | Overseas Investment Insurance | Principal Repayment | Interest | Total CPP | Capacity Charge @ 53.06% PF | | |
| | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | Rs/kWh | |
| 1 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 1126.6581 | 1478.6652 | 4,288.5917 | 11.0720 | 11.6973 | |
| 2 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 1210.1897 | 1395.1336 | 4,288.5917 | 11.0720 | 11.6973 | |
| 3 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 1300.0493 | 1305.2740 | 4,288.5917 | 11.0720 | 11.6973 | |
| 4 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 1396.7305 | 1208.5928 | 4,288.5917 | 11.0720 | 11.6973 | |
| 5 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 1500.7671 | 1104.5562 | 4,288.5917 | 11.0720 | 11.6973 | |
| 6 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 1612.7363 | 992.5870 | 4,288.5917 | 11.0720 | 11.6973 | |
| 7 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 1733.2622 | 872.0611 | 4,288.5917 | 11.0720 | 11.6973 | |
| 8 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 1863.0202 | 742.3030 | 4,288.5917 | 11.0720 | 11.6973 | |
| 9 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 2002.7412 | 602.5820 | 4,288.5917 | 11.0720 | 11.6973 | |
| 10 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 2153.2164 | 452.1069 | 4,288.5917 | 11.0720 | 11.6973 | |
| 11 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 2315.3024 | 290.0209 | 4,288.5917 | 11.0720 | 11.6973 | |
| 12 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 2489.9271 | 19.5168 | 4,288.5917 | 11.0720 | 11.6973 | |
| 13 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 1118.6236 | 297.2638 | 6.8440 | - | - | 1,921.5439 | 4.9609 | 5.5863 | |
| 14 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 1069.7377 | 297.2638 | 6.4414 | - | - | 1,872.2554 | 4.8336 | 5.4590 | |
| 15 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 1020.8518 | 297.2638 | 6.0388 | - | - | 1,822.9670 | 4.7064 | 5.3318 | |
| 16 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 971.9660 | 297.2638 | 5.6363 | - | - | 1,773.6785 | 4.5791 | 5.2045 | |
| 17 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 923.0801 | 297.2638 | 5.2337 | - | - | 1,724.3901 | 4.4519 | 5.0773 | |
| 18 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 874.1942 | 297.2638 | 4.8311 | - | - | 1,675.1016 | 4.3247 | 4.9500 | |
| 19 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 825.3084 | 297.2638 | 4.4285 | - | - | 1,625.8132 | 4.1974 | 4.8228 | |
| 20 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 776.4225 | 297.2638 | 4.0259 | - | - | 1,576.5247 | 4.0702 | 4.6955 | |
| 21 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 727.5367 | 297.2638 | 3.6233 | - | - | 1,527.2363 | 3.9429 | 4.5683 | |
| 22 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 678.6508 | 297.2638 | 3.2207 | - | - | 1,477.9478 | 3.8157 | 4.4410 | |
| 23 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 629.7649 | 297.2638 | 2.8181 | - | - | 1,428.6594 | 3.6884 | 4.3138 | |
| 24 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 580.8791 | 297.2638 | 2.4155 | - | - | 1,379.3709 | 3.5612 | 4.1865 | |
| 25 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 531.9932 | 297.2638 | 2.0129 | - | - | 1,330.0825 | 3.4339 | 4.0593 | |
| 26 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 483.1073 | 297.2638 | 1.6104 | - | - | 1,280.7940 | 3.3067 | 3.9320 | |
| 27 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 434.2215 | 297.2638 | 1.2078 | - | - | 1,231.5056 | 3.1794 | 3.8048 | |
| 28 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 385.3356 | 297.2638 | 0.8052 | - | - | 1,182.2171 | 3.0522 | 3.6775 | |
| 29 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 336.4498 | 297.2638 | 0.4026 | - | - | 1,132.9287 | 2.9249 | 3.5503 | |
| 30 | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 287.5639 | 297.2638 | - | - | - | 1,083.6402 | 2.7977 | 3.4230 | |
| Average(1-12) | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 879.9455 | 297.2638 | 7.2466 | 1,725.3834 | 871.9499 | 4,288.5917 | 11.0720 | 11.6973 | |
| Average (13-30) | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 703.0937 | 297.2638 | 3.4220 | - | - | 1,502.5920 | 3.8793 | 4.5046 | |
| Average(1-30) | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.65 | 201.78 | 188.38 | 773.83 | 297.26 | 4.95 | 690.15 | 348.78 | 2,616.99 | 6.7564 | 7.3817 | |
| Levelized Tariff | 0.1302 | 0.0701 | 0.4250 | 0.6254 | 108.6497 | 201.7781 | 188.3847 | 864.0874 | 297.2638 | 6.4595 | 1,149.9269 | 729.9374 | 3,549.7282 | 9.1644 | 9.7898 | |
| Levelized Tariff (1-30 years) discounted at 10% per annum = US Cents 7.9205/kWh at reference exchange rate of 1US\$=Rupees 123.60. | | | | | | | | | | | | | | | | |



ANNEXURE - 2:
DEBT REPAYMENT SCHEDULE



Annexure-2: Reference Debt Service Schedule

| Foreign Debt Loan Amortization Schedule (USD) Base | | | | | |
|---|------------------------|--------------------|-----------------|------------------|------------------------|
| Quarters | Opening Balance | Installment | Interest | Principal | Closing Balance |
| 1 | 147,313,736 | 4,540,218 | 2,544,709 | 1,995,510 | 145,318,226 |
| 2 | 145,318,226 | 4,540,218 | 2,510,238 | 2,029,980 | 143,288,246 |
| 3 | 143,288,246 | 4,540,218 | 2,475,172 | 2,065,046 | 141,223,199 |
| 4 | 141,223,199 | 4,540,218 | 2,439,500 | 2,100,718 | 139,122,481 |
| 5 | 139,122,481 | 4,540,218 | 2,403,212 | 2,137,006 | 136,985,475 |
| 6 | 136,985,475 | 4,540,218 | 2,366,297 | 2,173,921 | 134,811,554 |
| 7 | 134,811,554 | 4,540,218 | 2,328,745 | 2,211,473 | 132,600,081 |
| 8 | 132,600,081 | 4,540,218 | 2,290,544 | 2,249,674 | 130,350,407 |
| 9 | 130,350,407 | 4,540,218 | 2,251,683 | 2,288,536 | 128,061,871 |
| 10 | 128,061,871 | 4,540,218 | 2,212,150 | 2,328,068 | 125,733,803 |
| 11 | 125,733,803 | 4,540,218 | 2,171,935 | 2,368,283 | 123,365,520 |
| 12 | 123,365,520 | 4,540,218 | 2,131,025 | 2,409,193 | 120,956,327 |
| 13 | 120,956,327 | 4,540,218 | 2,089,409 | 2,450,810 | 118,505,518 |
| 14 | 118,505,518 | 4,540,218 | 2,047,073 | 2,493,145 | 116,012,373 |
| 15 | 116,012,373 | 4,540,218 | 2,004,006 | 2,536,212 | 113,476,161 |
| 16 | 113,476,161 | 4,540,218 | 1,960,196 | 2,580,023 | 110,896,138 |
| 17 | 110,896,138 | 4,540,218 | 1,915,628 | 2,624,590 | 108,271,548 |
| 18 | 108,271,548 | 4,540,218 | 1,870,291 | 2,669,927 | 105,601,621 |
| 19 | 105,601,621 | 4,540,218 | 1,824,170 | 2,716,048 | 102,885,573 |
| 20 | 102,885,573 | 4,540,218 | 1,777,253 | 2,762,965 | 100,122,608 |
| 21 | 100,122,608 | 4,540,218 | 1,729,525 | 2,810,693 | 97,311,915 |
| 22 | 97,311,915 | 4,540,218 | 1,680,973 | 2,859,245 | 94,452,670 |
| 23 | 94,452,670 | 4,540,218 | 1,631,583 | 2,908,636 | 91,544,034 |
| 24 | 91,544,034 | 4,540,218 | 1,581,339 | 2,958,880 | 88,585,155 |
| 25 | 88,585,155 | 4,540,218 | 1,530,227 | 3,009,992 | 85,575,163 |
| 26 | 85,575,163 | 4,540,218 | 1,478,232 | 3,061,986 | 82,513,177 |
| 27 | 82,513,177 | 4,540,218 | 1,425,339 | 3,114,879 | 79,398,297 |
| 28 | 79,398,297 | 4,540,218 | 1,371,532 | 3,168,686 | 76,229,611 |
| 29 | 76,229,611 | 4,540,218 | 1,316,796 | 3,223,422 | 73,006,189 |
| 30 | 73,006,189 | 4,540,218 | 1,261,114 | 3,279,104 | 69,727,085 |
| 31 | 69,727,085 | 4,540,218 | 1,204,471 | 3,335,747 | 66,391,338 |
| 32 | 66,391,338 | 4,540,218 | 1,146,849 | 3,393,369 | 62,997,969 |
| 33 | 62,997,969 | 4,540,218 | 1,088,232 | 3,451,987 | 59,545,982 |
| 34 | 59,545,982 | 4,540,218 | 1,028,602 | 3,511,616 | 56,034,366 |
| 35 | 56,034,366 | 4,540,218 | 967,942 | 3,572,276 | 52,462,089 |
| 36 | 52,462,089 | 4,540,218 | 906,234 | 3,633,984 | 48,828,105 |
| 37 | 48,828,105 | 4,540,218 | 843,460 | 3,696,758 | 45,131,347 |
| 38 | 45,131,347 | 4,540,218 | 779,602 | 3,760,616 | 41,370,731 |
| 39 | 41,370,731 | 4,540,218 | 714,641 | 3,825,577 | 37,545,154 |
| 40 | 37,545,154 | 4,540,218 | 648,558 | 3,891,660 | 33,653,494 |
| 41 | 33,653,494 | 4,540,218 | 581,333 | 3,958,885 | 29,694,608 |
| 42 | 29,694,608 | 4,540,218 | 512,947 | 4,027,271 | 25,667,337 |
| 43 | 25,667,337 | 4,540,218 | 443,380 | 4,096,839 | 21,570,498 |
| 44 | 21,570,498 | 4,540,218 | 372,610 | 4,167,608 | 17,402,891 |
| 45 | 17,402,891 | 4,540,218 | 300,619 | 4,239,599 | 13,163,291 |
| 46 | 13,163,291 | 4,540,218 | 227,384 | 4,312,835 | 8,850,457 |
| 47 | 8,850,457 | 4,540,218 | 152,883 | 4,387,335 | 4,463,122 |
| 48 | 4,463,122 | 4,540,218 | 77,096 | 4,463,122 | 0 |



| Local Debt Loan Amortization Schedule (USD) Base | | | | | |
|--|-----------------|-------------|----------|-----------|-----------------|
| Quarters | Opening Balance | Installment | Interest | Principal | Closing Balance |
| 1 | 16,368,193 | 608,931 | 437,031 | 171,901 | 16,196,292 |
| 2 | 16,196,292 | 608,931 | 432,441 | 176,490 | 16,019,802 |
| 3 | 16,019,802 | 608,931 | 427,729 | 181,203 | 15,838,599 |
| 4 | 15,838,599 | 608,931 | 422,891 | 186,041 | 15,652,559 |
| 5 | 15,652,559 | 608,931 | 417,923 | 191,008 | 15,461,551 |
| 6 | 15,461,551 | 608,931 | 412,823 | 196,108 | 15,265,443 |
| 7 | 15,265,443 | 608,931 | 407,587 | 201,344 | 15,064,099 |
| 8 | 15,064,099 | 608,931 | 402,211 | 206,720 | 14,857,379 |
| 9 | 14,857,379 | 608,931 | 396,692 | 212,239 | 14,645,139 |
| 10 | 14,645,139 | 608,931 | 391,025 | 217,906 | 14,427,233 |
| 11 | 14,427,233 | 608,931 | 385,207 | 223,724 | 14,203,509 |
| 12 | 14,203,509 | 608,931 | 379,234 | 229,698 | 13,973,811 |
| 13 | 13,973,811 | 608,931 | 373,101 | 235,831 | 13,737,981 |
| 14 | 13,737,981 | 608,931 | 366,804 | 242,127 | 13,495,854 |
| 15 | 13,495,854 | 608,931 | 360,339 | 248,592 | 13,247,262 |
| 16 | 13,247,262 | 608,931 | 353,702 | 255,229 | 12,992,032 |
| 17 | 12,992,032 | 608,931 | 346,887 | 262,044 | 12,729,988 |
| 18 | 12,729,988 | 608,931 | 339,891 | 269,041 | 12,460,947 |
| 19 | 12,460,947 | 608,931 | 332,707 | 276,224 | 12,184,723 |
| 20 | 12,184,723 | 608,931 | 325,332 | 283,599 | 11,901,124 |
| 21 | 11,901,124 | 608,931 | 317,760 | 291,171 | 11,609,953 |
| 22 | 11,609,953 | 608,931 | 309,986 | 298,946 | 11,311,007 |
| 23 | 11,311,007 | 608,931 | 302,004 | 306,927 | 11,004,080 |
| 24 | 11,004,080 | 608,931 | 293,809 | 315,122 | 10,688,958 |
| 25 | 10,688,958 | 608,931 | 285,395 | 323,536 | 10,365,421 |
| 26 | 10,365,421 | 608,931 | 276,757 | 332,175 | 10,033,247 |
| 27 | 10,033,247 | 608,931 | 267,888 | 341,044 | 9,692,203 |
| 28 | 9,692,203 | 608,931 | 258,782 | 350,150 | 9,342,054 |
| 29 | 9,342,054 | 608,931 | 249,433 | 359,498 | 8,982,555 |
| 30 | 8,982,555 | 608,931 | 239,834 | 369,097 | 8,613,458 |
| 31 | 8,613,458 | 608,931 | 229,979 | 378,952 | 8,234,506 |
| 32 | 8,234,506 | 608,931 | 219,861 | 389,070 | 7,845,436 |
| 33 | 7,845,436 | 608,931 | 209,473 | 399,458 | 7,445,978 |
| 34 | 7,445,978 | 608,931 | 198,808 | 410,124 | 7,035,854 |
| 35 | 7,035,854 | 608,931 | 187,857 | 421,074 | 6,614,780 |
| 36 | 6,614,780 | 608,931 | 176,615 | 432,317 | 6,182,463 |
| 37 | 6,182,463 | 608,931 | 165,072 | 443,860 | 5,738,604 |
| 38 | 5,738,604 | 608,931 | 153,221 | 455,711 | 5,282,893 |
| 39 | 5,282,893 | 608,931 | 141,053 | 467,878 | 4,815,015 |
| 40 | 4,815,015 | 608,931 | 128,561 | 480,370 | 4,334,645 |
| 41 | 4,334,645 | 608,931 | 115,735 | 493,196 | 3,841,448 |
| 42 | 3,841,448 | 608,931 | 102,567 | 506,365 | 3,335,084 |
| 43 | 3,335,084 | 608,931 | 89,047 | 519,885 | 2,815,199 |
| 44 | 2,815,199 | 608,931 | 75,166 | 533,766 | 2,281,434 |
| 45 | 2,281,434 | 608,931 | 60,914 | 548,017 | 1,733,417 |
| 46 | 1,733,417 | 608,931 | 46,282 | 562,649 | 1,170,768 |
| 47 | 1,170,768 | 608,931 | 31,259 | 577,672 | 593,096 |
| 48 | 593,096 | 608,931 | 15,836 | 593,096 | 0 |

